The Builder.

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ILLUSTRATIONS.

Restaurant, Great Portland-street.....Professor Beresford Pite, F.R.I.B.A., Architect.
Competition Design for University Buildings, Cape Town.....By Mr. W. F. Harber.
House, Medmenham .....Mr. Reginald Blomfield, Architect.
Mansfield House University Settlement .....Mr. F. W. Troup, F.R.I.B.A., Architect.
Club Pavilion, Oxford .....Mr. Ronald P. Jones, Architect.
Constitutional Club, Shoreditch .....Mr. Sydney W. Cranfield, A.R.I.B.A., Architect.

Illustrations in Text.

St. Clement Danes and St. Paul's: as seen from Newcastle-street during the present alterations. Drawn by Mr. A. C. Conrade..... Page 194
Constitutional Club, Shoreditch. Plans..... Page 198
Building for the Consolidated Clubs, Oxford. Plans ..... Page 199
The Student's Column:—
Figs. 44 to 46 ..... Page 200

CONTENTS.

	PAGE
The Institute and the London Building Act	183
The Storage of Flood Water	185
Notes	185
Additions and Alterations to Town Hall, Sunderland	188
Views of St. James's Park and Around.....	189
Sewage and Shellfish	189
The Royal Institute of British Architects	189
The London County Council	192
Applications under the 1894 Building Act	193
New Views of London Buildings	194
Architectural Societies.....	195
The Sanitary Institute	196
By-laws under the Public Health (London) Act, 1891	197
Illustrations:—	
Restaurant, Great Portland Street	198
Design for Cape University Buildings	198
House at Medmenham	198
Mansfield House University Settlement, Barking-road, E.	198
Pavilion for the Consolidated Clubs, Magdalen College, Oxford	198
Constitutional Club, Shoreditch	199
Competitions	199
Books Received	199
The Student's Column.....	199
American Professional Practice	200
Court of Common Council	201
Westminster City Council	201
Royal Commission on London Locomotion	201
Obituary.....	202
General Building News	202
Sanitary and Engineering News	203
Foreign	203
Miscellaneous	203
Capital and Labour	204
Legal:—	
Relaying a Drain—Tenant's Liability.....	204
Action to Enforce a Charge of Paving Expenses	205
Patents	205
Some Recent Sales	206
Meetings	207
Prices Current	207
Tenders	208

The Institute and the London Building Act.

THE Institute of Architects has now published, in the *Journal of Transactions*, the schedule of amendments to the London Building Act which, pursuant to a Report by the Professional Practice Committee, it has recommended to the London County Council for their consideration. The detailed recommendations are prefaced by some considerations in regard to general principles. The most important of these are, first, that the Act should be re-edited to secure better classification and language more intelligible to the majority of those who have to use it, who are often "inexperienced in legal phraseology." There is, however, more required than is expressed in these words, for, as we pointed out at the time the present Act was passed, there are enactments in it which, however innocently worded to first appearance, in their application result in absurdities. It is also recommended that more discretionary power should be given to the Council, the Superintending Architect, and the District Surveyors, to meet special cases arising; also a wise precaution, since there are cases from time to time in which a district surveyor is compelled, by the letter of the law, to oppose or to take proceedings for operations which he must or ought to know in his own mind are harmless in themselves; we say "ought to know," because we fear there are surveyors who rather enjoy the opportunity of exercising a little official tyranny in the name of a hard-and-fast law or by-law. But perhaps the most important of the general principles recommended by the Institute is that district surveyors should be practising architects. This is a return to the old *régime*, which was abolished we know not why, and which certainly tends to secure a higher class of men to fill the office than are likely to be secured otherwise.

We fear we must take exception to the very first proposal of the Institute, that the definitions of "street" and "way" are too comprehensive: "a court, alley, or passage not dedicated to the public and not a thoroughfare should be exempt." We do not think this is likely to be listened to; if it is made less comprehensive it is very likely to leave openings for adroit evasions; and as the Institute have also recommended greater power of discretionary action, that ought to be sufficient to cover objections to the comprehensive wording complained of. Of the other suggestions, in respect of section 5 ("Definitions") a deficiency seems to be filled up by the proposal that in clause 20, defining a "party structure," the definition should also apply to any substructure on which a party wall is erected, where such wall does not extend down to the ground or foundation level as a (legal) party wall. Clause 25 is proposed to be rendered more definite by substituting for "principally for human habitation" the words "to a greater extent than half the cubic contents," etc. This is better than "principally," a term to which it is difficult to assign a legal meaning. Two other points in the proposals in regard to the "Definitions" section fill us with astonishment; one is a demand that the term "working class" should be defined. Who is to do it? The Institute committee have evidently shrunk from the task. The other is, that *no* request is made that the word "building" should be defined. The want of such a definition is one of the greatest and most frequently criticised omissions in the Building Act, and the Institute committee pass it over without a word. The Act defines the difference between a new building and an old building, but omits to say what a building is to begin with. In the absence of any definition from the Institute, we will offer our own:—

> "A Building is any erection whether roofed or not which encloses a space and which is permanently attached to or placed on the ground or (in the case of an addition) is permanently attached to the main building.
>
> A Structure is any erection under similar conditions which does not enclose a space."

This, we think, covers everything which ought to be defined as a building. The words "permanently attached to *or placed on* the ground" cover the case where a shed, for instance, has been placed on the ground which, though removable in a structural sense, has been placed there for permanent use and is obviously intended so to remain. On several occasions it has been held in a court of law that such an erection, under the circumstances, is a "building" within the meaning of the Act. The words "or is permanently attached to the main building" cover the case of an erection, such as a small conservatory, which may be bracketed out from the main building but has no direct connexion with the ground. The addition of the definition of a "Structure" covers the case where, as is mentioned further

on, "building or structure" are used in the Act as alternative terms.

We pointed out before, also, that "sites" ought to be formally defined, inasmuch as clause 164 gives power to make by-laws in regard to (*inter alia*) "foundations and sites of buildings"—referred to as two different things; "foundation" is defined while "site" is not. We may also again point out that "story" (or, as the authorities incorrectly spell it, "storey") is not defined; an omission which might conceivably lead to complications in a court of law.

In their "General Principles" suggestions the Institute remark that "the schedule of fire-resisting materials wants reconsideration." We do not know whether this means that it wants adding to or subtracting from; it is pretty comprehensive, besides the addition of the general clause "any material from time to time approved by the Council as fire-resisting"; and the varieties in fire-proof flooring are more extensive in the arrangement than in the nature of the materials. We should be inclined, however, to add after "iron or steel" the words "when not exposed"; and felt might be added to the list of fire-resisting materials, with the proviso "when the underside is not exposed," or "when only one side is exposed." It also should be clearly stated in the revised Act whether "incombustible" means the same as "fire-resisting." Both expressions are used in the Act, but a material may be one and not the other; thus, the "granite and other stone suitable for building purposes" are "incombustible" but they are not "fire-resisting," and in regard to such materials there ought to be some qualifying expression if they are included in the fire-resisting schedule.

In regard to section 8 the Institute make a useful suggestion in adding after "street" the words, "and throws the same open for public use," making this a requirement for the legal "commencement" of a street, which is certainly only fair to the occupier of the land. The Institute make some other useful suggestions in reference to the street sections, but they make no criticism on the rather absurd conclusion to section 8, that no person shall be deemed to have commenced a street if he do any of the acts named in the section "for some other purpose than laying out a street," a really absurd sentence to stand in a legal document: how is the law to judge of "purpose" but by outward acts? Besides, whatever the sentence was apparently meant to safeguard is provided for by the addition just suggested as to throwing open the street; under that sentence he has not "commenced" a street until he throws it open to the public; that is the real test, and this absurd clause about his "purpose" should be withdrawn at the same time.

These are minor matters, but it is little credit to the enterprise or the perception of the Committee that they have made not the slightest attempt to suggest an improvement on the wretched provision of section 12, which ordains 40 ft. as the width of the ordinary London street and 60 ft. as the extreme limit of width in exceptional cases. The idea of these limits being permanently accepted as the limits of width for London streets—*i.e.*, an average width equal to Chancery-lane, and an extreme width, in special cases, hardly equal to that of the eastern portion of Oxford-street (which is 63 ft.)—is really contemptible, whether we consider it from the point of view of architectural effect, sanitary conditions, or convenience of traffic; and the fact that a Committee of the Institute, drawing up suggestions for the amendment of the Building Act, could pass over these clauses without making even any tentative suggestion for their alteration, seems to show that the Practice Standing Committee was hardly the proper body to entrust this work to. There should have been a special committee appointed who would have had their eyes open to architectural as well as to business considerations. We take it that this condition must be altered, or the London County Council will stultify itself; but it would have been more to the credit of the Institute of Architects if they had been the body to suggest and to press on the governing authority the inadequacy of the street widths contemplated by the existing Act. Probably the sole reason for carefully ignoring this question is the necessity for compensation where a street is gradually widened from its former dimensions; but, if we are ever to see London streets of an adequate width, compensation must sooner or later be faced, the necessary addition to the rates being a lesser public evil than the choking of our streets by inadequate dimensions.

Section 21, putting the School Board buildings out of the operation of the present Act, which ought never to have been introduced, it is proposed to omit "as obsolete." A constant source of contention in regard to the line of frontage of corner buildings it is proposed to remove by an addition to section 22 (1), to the effect that in the case of a new building at the corner of two streets the superintending architect "shall have regard to the general line of frontage of the principal street only," on the principle that a building only fronts one way. No notice is taken of the anomaly of the words "building or structure" in section 26, which are used as if they had different meanings, while the meaning of neither has been defined; and the Committee make no further suggestions till we come to section 39, where, in accordance with a previous alteration, it is proposed, instead of "wholly or principally as offices," etc., to read "to a greater extent than half the cubical contents as offices, counting-houses, or business premises other than buildings of the warehouse class." This is certainly an advance in clearness of definition.

In regard to section 41, referring to spaces in connexion with buildings, the words "space open to the sky" are proposed to be substituted for "open space." This may be on the safe side in definition, though one could hardly think that there could really be any question as to what is intended by "open space." In reference to clause 2, requiring that such open space "shall extend through the entire width of such building," etc., the committee propose to substitute the following:—

"No building shall in any part thereof be nearer to the rear boundary of the curtilage thereof than 10 ft. provided that in the case of any building upon a corner site the said area may be arranged in a convenient position to the satisfaction of the superintending architect and not necessarily extend the entire width of the rest of such building."

This is another and praiseworthy attempt to get rid of the constructive injustice to which owners of corner lots are subjected, in one way or another, from the wording of the existing Act. In regard to section 47, which deals with the limit of height of buildings, the Committee, again taking into consideration the difficulties of the corner lot, propose the following paragraph to be inserted before the last paragraph of the section:—

"Where any building is erected or intended to be erected on a corner plot so as to abut upon more than one street the height of the building shall (unless the Council otherwise consent) be regulated by the wider of such streets so far as it abuts or will abut upon such wider street and also so far as it abuts or will abut upon the narrower of such streets to a distance of 40 ft. from the building frontage in such wider street. The height of the remaining portion of the frontage to the narrower street shall be limited by the section regulating the height of buildings in such street except that it shall be lawful in such case where the buildings previously existing on such remaining portion were of a greater height to rebuild them to the same height or heights."

In considering section 49, we are again astonished to find that the Committee have made no protest against the absurd anomaly by which, according to the existing Act, a street 6 in. less than 50 ft. in width is restricted to buildings the same height as the width of the street, while a street 6 in. over 50 ft. in width may be lined with buildings 80 ft. high. This anomaly is not, of course, so plainly specified in words, but that is the effect of the section, which we pointed out in the strongest manner at the time when the present Act was under consideration; and it seems extraordinary that a committee appointed to consider the improvement of the Act should have let such a point pass them without notice or suggestion. It is one of the greatest absurdities of the existing Act, apparently arising from nothing but the desire to save the trouble of more detailed regulation of heights. The rule, plain and simple and easily laid down, ought to be that the flanking buildings do not exceed in height the distance between the opposite frontages. The Act lays down this principle in regard to any street under 50 ft. in width, and immediately quits it as soon as that limit is passed. It is perfectly ridiculous; it is contrary to common sense, to sanitary conditions, and to architectural effect; and what are we to think of a committee of the Institute of Architects who let such a point pass them without note or comment, while splitting hairs about points quite unimportant in comparison? It is to be hoped, at all events, that the County Council will not suppose that the Professional Practice Committee adequately represents the perception of the architectural profession on such matters.

With Section 53 we come to the reference to the schedule of thicknesses of walls appended to the Act. As to the section itself, the Committee propose the addition of the following words:—"Except as hereinafter provided under the section relating to steel construction," which is, of course, a reasonable and even necessary addition. We now turn to the end of the Committee's proposals to see what they have to say in regar-

to the "First Schedule." The Committee pass over the obvious (as we should have thought) contradiction in terms of Sections 3 and 4 of the schedule, of which 3 says that "any" wall not built of the class of materials before described, shall be one-third thicker than the schedule thickness; while 4 proceeds to say, immediately after, that walls of houses, built of other materials than specified, shall be sufficient if built of the thicknesses specified in parts 1 and 2 of the schedule. The two are an absolute contradiction in terms; and Section 3 is a contradiction in itself, since it is headed "thickness of stone walls," and refers to walls "built of *brick or stone* in horizontal courses," as if brick walls could be built otherwise. The Committee take no notice of this; but the first thing they do is to suggest the abrogation of what we described at the time as the exceedingly wholesome rule embodied in Section 5, to the effect that in hollow walls there should be a wall at one side of the cavity of the full thickness prescribed by the Act. Instead of this the committee propose a long clause, having the effect that hollow walls may be constructed where the aggregate thickness of the two equals what is prescribed by the Act, and where there are approved ties between them, and that the inner wall be not less than 8½ in. thick. This seems to be a distinct step backward in sound building, and evidently suggested in the interest of building-owners. An addition to section 8 provides that where a wall without return walls is divided into portions of different heights, "the thickness of each of such portions shall be governed by the height of such portion and by the length of the entire wall." This supplies a detail of definition overlooked in the Act, which practically only contemplates walls of the same height throughout their length; and it is a reasonable emendation. But we cannot approve of the following proposed new section:—

"If any external or party wall measured from centre to centre is not more than twenty-five feet distant from any other external or party wall to which it is tied by the beams of any floor or floors other than the ground floor or the floor of any storey formed in the roof the length of such wall is not to be taken into consideration in deciding the thickness."

This seems plausible, but it is a move in the direction of less solid and substantial building, and as such we regret that it comes from the Institute of Architects. It is again a demonstration in favour of the client, not in favour of the best building. A floor, or a series of floors (and the clause does not demand even that), may be made as much of a tie as a cross wall, or nearly so, but there are many cases and many forms of floors in which this will not be the case; and it will be observed that no reservation is made as to the type of floor; it may be only ordinary wooden joists; and if there is one such floor as this between the ground floor and roof, this is to put the length of the wall out of consideration; and in the case of a fire, in which this floor is burned away, matters will be still worse. If there had been any careful definition of the kind of floor which might form the best and most solid tie between walls it would be different; but there is none. In this and some other instances the Committee give one the impression of having been actuated rather by a desire to secure cheaper building for their clients than to carry out the best conditions of durability and stability in building. Again, in the second section of Part I. of the actual schedule, which rules that a wall less than 30 ft. in length and comprising more than two stories, may be 8½ in. thick for its whole height, the Committee coolly suggest striking out the words "does not comprise more than two storeys," without suggesting any other limitation, leaving it in effect that a wall not more than 30 ft. in length may be carried to any height you please at a uniform thickness of 8½ in.! Did the Committee really contemplate that result? and if not, why did they not think better of the meaning of what they were doing? The alteration is an ill-advised one in any case; the existing provision is a perfectly reasonable one; but to remove the restriction without suggesting any other in regard to height is an act of absurdity which one must regret to see.

We shall return to the subject in another issue.

THE STORAGE OF FLOOD WATER.

FROM every part of the country we have lately had tidings of heavy rainstorms and disastrous floods. The state of things in the Thames valley particularly attracts the attention of those living in or near the metropolis, but the damage done in various provincial districts is very serious. The strange thing is the apathy with which inundations of the kind are regarded by governing bodies. Periodical floods on one hand and droughts on the other are alike accepted with Oriental fatalism, and no attempt is made to deal with them in a practical manner.

Those who have studied the vagaries of British rainfall know that we generally suffer from the alternating succession of wet and dry periods of various intensity and duration. From 1875 to 1883 we had an exceedingly wet period, and the floods then caused by excessive rainfall directed a certain amount of attention to the necessity of legislation for the conservation and utilisation of flood waters. Since 1884, however, there has been an unusually dry period, and the comparative absence of floods probably accounts for the fact that nothing has been done in the direction indicated above. Nevertheless, water engineers are perfectly agreed upon the necessity for the adoption of measures by which extremes of water supply may be adjusted from season to season and from year to year. Even in average years the volume of water wasted during the winter would be of immense value if it could be stored for use in the summer. In addition to the utilisation of rainfall for domestic and trade purposes, it might be employed for the improvement of rivers and, in many cases, for the development of power. In other countries the desirability of storing surplus water for use in periods of drought is fully recognised. In Russia flood water is collected and used for irrigation and other purposes, and a similarly intelligent policy is pursued in India. We have a recent example in Egypt, where the construction of reservoirs has permitted the storage of water with great advantage, not merely to the inhabitants of the Nile Valley, but to the community at large. Nothing of the kind has ever been attempted on a comprehensive scale in England, although the matter is clearly of national importance and the necessity for such treatment has long been recognised by engineers.

The advantages that would follow the systematic regulation of the Thames and its tributaries should be sufficiently obvious. So far as concerns the practicability of such a scheme, we may refer to the opinion recently expressed by Professor Henry Robinson, that the flood waters of the Thames and its tributaries might be conserved at small cost from more than one gathering ground that he has investigated. As we have said on a previous occasion, we have no doubt whatever that the proper storage of surplus waters would have the effect of greatly diminishing, if not of entirely preventing, the serious floods prevalent in the Thames valley and of furnishing an ample surplus of water for the future requirements of the metropolis. The storage of flood water would also make it possible to augment the flow of the Thames in dry weather, thereby improving the sanitary condition of the river and rendering it more useful as a highway for navigation. A similar course of treatment could also be adopted in the case of other rivers throughout the country with much advantage to the community, and it is clearly time for the subject to be taken up by Parliament without further delay.

NOTES.

The Labour Market. THE statistics furnished by the Board of Trade in relation to employment, and which are based on information derived from the Trades Unions, do not disclose any great signs of improvement. On the average for ten years, January showed an increase in the number of unemployed of nearly 2 per cent., and the whole of 1903 discloses an increase of about 1 per cent. The bad weather seriously affects outdoor occupations, and especially agricultural labour. The building trades may in a less degree have suffered from the same cause, although an open winter is, on the whole, favourable; but other causes must chiefly be responsible, since the report shows that a decline in the demand for labour in the building trades has continued ever since the year 1900.

The Public Health Acts v. Tenants' Liabilities. IT is welcome news that some legislation is contemplated in connexion with the Public Health Acts, but it is to be hoped it will not take the form of a consolidating statute alone, but that some attempt will be made to simplify the law also. The case of *Lumby* v. *Faupel*, decided in the Court of Appeal last week, settled an important point under section 150 of the Public Health Act, 1875. Stated shortly, the decision is that the terms of a lease which contained a covenant to pay "all rates, taxes, and assessments whatsoever which now are or during the said term shall be imposed or assessed upon the said premises, etc.," did not place upon the tenant the liability to pay for paving expenses which had

been carried out and completed before the commencement of his lease, but which had not been apportioned amongst the frontagers under section 150 until after the commencement of the tenancy. We commented upon this case when it was heard in the Divisional Court. The learned judges there based their decision upon the ground that the word "assessments" did not embrace the paving expenses. The judges passed very stringent remarks on the state of the law on this point, and the difficulty there was in arriving at any satisfactory decision. We have commented on the various cases decided upon the point during the past few years, and tenants cannot be too careful in taking advice on these covenants in leases which, under the existing Local Government Acts, may impose quite unlooked-for burdens upon their shoulders.

Arbitrators' Fees. A CASE of considerable importance to litigants and to arbitrators was decided last week by the Court of Appeal. A dispute between a water company and an urban district council was referred to arbitration; two arbitrators were appointed, and also an umpire, and an award was made of over 13,000*l.* in favour of the water company. The costs of the successful party were duly brought in for taxation—that is, for review by a legal official, so that the unsuccessful party should pay no more than was reasonable. On the taxation the Taxing Officer disallowed 119*l.* 5s. of the total of 476*l.* 12s., the amount charged by the umpire and arbitrators as their fees, and, therefore, the water company had to pay the balance out of its own cash-box, since it could not be recovered from the district council. Not satisfied so to do, the water company commenced an action to recover back the sum from the umpire and arbitrators, on the ground that the amount charged by them was extortionate, and on the trial judgment was given for the claim. This judgment has now been reversed by the Court of Appeal, because it could not be held that the amount charged was extortionate. It may have been large, and even unusually large—though we do not say it was—but it clearly was not extortionate, which was the only ground on which the money could be recovered back. The moral of the whole business is that, if parties call in as arbitrators and umpires men of high professional position who make large incomes, they must expect to pay large fees; though it should be noted that the amount charged is less than 5 per cent. on the total award. The case exemplifies again, too, the absurdity of having two arbitrators and an umpire—the former are merely advocates for their respective sides, and their employment is an absolute waste of money. One arbitrator is not only less costly than two arbitrators and an umpire, but is equally effective to decide a dispute.

Matter and Electricity. THE article on "Matter and Electricity," by Mr. Whetham, in the *Quarterly Review*, to which we have already referred, is one of very great interest and importance. Mr. Whetham was one of the earliest explorers in the field of electrolysis, and his researches on ionisation and the velocity of ions have given him a European reputation. He discusses the question of what electricity is from the physical rather than from the mathematical point of view. In modern science the chemical atom is supposed to be made up of corpuscles. These corpuscles, or electrons, as they are called in mathematical theory, are in rapid orbital or oscillatory motion within the atom somewhat like the planets within the solar system. Now it can be proved that an electric charge moving rapidly has appreciable inertia—that is, it acts as if it had mass. Hence we can, if we please, explain mass by saying that it is electricity in motion. The metaphysical question then arises, Has matter any objective reality? Granting that it is only disembodied energy, the further question arises, What is the nature of electricity? and here neither the physicist nor the mathematician help us. Matter may be explained by saying that it is merely electric charges in motion, but the ultimate mystery is, if anything, intensified. Mr. Whetham considers what light recent discoveries in radio-activity throw on this subject. By definite processes we can obtain from thorium minute quantities of substances which are much more radio-active than thorium itself. The original thorium is now less radio-active. In a few days the products have lost their radio-active properties and the original thorium has recovered. The only explanation seems to be that some change was made in the constitution of the atoms themselves during the original process; in fact, that a partial but true transmutation of the elements was accomplished, thus in part realising the dream of the mediæval alchemist. Radium is a substance in an unstable state gradually turning into matter. It seems permissible to suppose that millions of years ago nearly every substance was radio-active, or even that radio-active substances themselves may have been formed by the disintegration of parent atoms which are now non-existent on our globe. We know that radium is undergoing a continual but slow (from the human point of view) process of evolution into another substance. May not all matter be doing the same? We are no longer justified in making the assumption that all matter is essentially eternal and unalterable.

Electrically-Driven Concrete Mixers. IN view of the fact that electric motors are now being applied in almost every branch of industry, it is somewhat to be regretted that building and other contractors are so slow to take advantage of the latest means for working their machinery and plant. There are many places in which the application of electricity for driving concrete mixers would be of very great service, and far more convenient than the mechanical transmission of power. Even when current is used for the purpose of lighting on structural works, it is generally the case that no other application of electricity is made. Yet the extreme convenience of the electric motor, and the ease with which it can be adapted to work in positions where power cannot readily be transmitted by shafting or belting, should commend it to all. Concrete mixers, especially, have often to be fixed in most inconvenient places for the transmission of power, but when electricity is available it is perfectly easy to arrange for electrical driving. A very useful type of electrically-driven concrete mixer, recently used in the construction of a retaining wall at one of the works of the Carnegie Steel Company, was driven by a motor by means of flexible chain and intermediate gearing, and being mounted on a two-wheeled truck, the whole apparatus could be moved from point to point along the wall, in a manner that would have been impossible with a machine driven from a steam engine.

The Brooklyn Bridge. ANOTHER addition to the cross-river facilities between New York and Brooklyn is suggested by the proposed reconstruction of the well-known Brooklyn Bridge, so as to increase its capacity without overloading the existing masonry. The scheme includes the conversion of the present single-deck structure into a double-deck bridge, with accommodation for four elevated and two trolley tracks and two 17 ft. wide roadways. In the new design it is proposed that the cables shall carry the live load and the weight of the floor construction proper, and that the stiffening trusses shall carry their own weight and that of the wind and lateral bracing. The cost of the work is estimated at over one million pounds, and the reconstruction will give accommodation for double the present traffic. We understand that the plans recently submitted by the Bridge Commissioner are not final, being intended simply as a basis for further detailed study, which, it may be hoped, will include consideration of the existing terminal facilities. Unless these are considerably extended, it would be of little use to enlarge the bridge structure as the terminals are at present the main cause of congestion during busy times of the day.

Hampstead Heath Protection Society. THE Seventh Annual Report of the Hampstead Heath Protection Society shows that the Society are doing all they can to preserve the Heath from the various injurious influences which threaten to destroy its old character, but we fear it is a rather discouraging fight against persistent encroachment. The Committee regret that what they call the "misplaced trees" on the east side of Spaniard's-road still remain, and as they grow will block out "the much-admired view of London." This seems a little capricious, for surely people do not go to Hampstead for a view of London, but rather to forget it and to feel how thoroughly (at present) they are in the country at such a short distance from London. The Committee regret, and here we are entirely with them, that the site of "The Pryors" was not saved from the builders, but that huge blocks of flats have been built there. The County Council, we are glad to find, have supported the Committee in getting Easter "shows" removed from the neighbour-

hood of the East Heath-road. The Committee are strenuously prosecuting their scheme for securing 80 acres of ground to interpose between the Heath and the buildings which will probably be erected on the Eton College land near the North-west Heath. A large sum of money has already been promised for this purpose, and it is hoped that this praiseworthy scheme is in a fair way to be realised. A shelter for birds has been completed, and the Committee suggest that every opportunity should be taken of planting and promoting the growth of such wild flowers as were formerly plentiful on the Heath, but are now in danger of extinction.

Marble Tables in Churches.

IT is the law that a fixed stone or marble table, otherwise an "altar," is illegal in an English church. This state of things has produced, in regard to St. Luke's, Chelsea, a rather curious difficulty. It appears that it was intended to place in that church, as a memorial to the late vicar, a marble table or altar—marble being selected on the advice of the architect for artistic reasons. When the faculty was applied for the application was, in the first place, for a marble structure on brass castors, this being regarded as a sufficient compliance with the law; on the advice of counsel, however, the application was amended so as to be for a structure with a wood top and marble sides and ends, so that it was more nearly a table and less an altar in character. When the case came before Dr. Tristram in the Consistory Court of London last week, it was adjourned, that the amended petition might be served, but it would seem that there will be no opposition to the application in its new form. We confess, however, that the structure appears so hybrid in character that it cannot have artistic merit; a wooden table covered in part with marble mosaics is, in fact, a sham, and shams never were and never will be really artistic.

Coutts' Bank, West Strand.

MESSRS. COUTTS AND CO. will shortly remove to the new premises built for them by Messrs. Holland and Hannen after Mr. J. Macvicar Anderson's plans and designs. For their new banking-house they acquired the Lowther Arcade, with frontages in Adelaide-street and the Strand, erected in 1830-2 from designs by Witherden Young, who was architect also of the adjoining Adelaide Gallery (since absorbed in a well-known restaurant) for Jacob Perkins, the engineer, in the three-sided block built by Burton, as part of the improvements made in the West Strand district under the Act 7 George IV., c. 77. The Arcade, closed in April, 1902, consisted, as originally designed, of twenty-five shops, with six more at the two ends in Adelaide-street and West Strand, covering about 16,000 sq. ft. and held from the Crown under one lease, of which twenty-seven and a half years were then unexpired, at a ground rent of 1,270*l.* per annum. The London County Council have bought the lease of the present banking-house for additional offices. The north portion is comprised in the block that was built on the site of the Burse of Britain, commonly known as the New Exchange, as erected in 1608-9. To that block, at the sign of the Three Crowns, on land leased to him by Lord Salisbury, George Middleton removed from St. Martin's-lane. He died in 1749; his successor, George Campbell, goldsmith and banker, took as partner, in 1755, his niece's husband, James Coutts, a son of John Coutts, Lord Provost of Edinburgh and founder of the bank in old Parliament Close, Edinburgh. The brothers Adam rebuilt the banking-house for James and his brother Thomas, making a subway to the strong-rooms on the south side of William-street in the Adelphi. Thomas Coutts (*obiit* 1822) arranged with Robert Adam for the laying out of Robert-street so as to preserve the view from his drawing-room across the river to the Surrey hills beyond. In 1799 he obtained an Act, 39 George III., c. 1, for "a covered passage" or bridge across William-street. The Baptist chapel at the corner of James and William streets was afterwards taken for an extension of the premises, and in 1838-9 some alterations and improvements were carried out by Thomas Hopper for the firm who, in June, 1892, were reconstituted as Coutts and Co.

Royal Academy Lectures.

DR. MURRAY commenced on Monday the first of a course of historical lectures on sculpture, his subject being "Sarcophagi," or, rather, the sculptures with which they were adorned. He observed that the normal ancient Greek funeral, the burning of the body, was usually on a hill, with the idea that the soul of the departed would thence more readily ascend to the gods; but hills were not always available. The body of Patroclus, for instance, was burned upon the plain of Troy, and games and mock combats solemnised the occasion. Hence, when sarcophagi came into use, such celebrations formed the subject of their decorations. The earliest sarcophagus illustrated, however, that of Clazomenæ, was not sculptured but painted, and represented the defeat of the Cimmerians, and as an episode, the execution of Dolon. He turned next to a marble sarcophagus of about the same date, now in the New York Museum. This was in a fine style of low relief, and though found in Cyprus, was probably made in Asia Minor, for the work was too good for Cyprus in the VIth century. This showed hunting scenes—probably indicative of the occupations in the future life—and a banquet scene, in which one man, the deceased, was seated separately from the rest; a tree introduced was, no doubt, a symbol of Elysium, since actual Greek banquets were not held in the open air. He showed also a Lycian relief of about the middle of the VIth century, found by Sir C. Fellows; probably part of one of those gabled Lycian tombs of which there is an example in the British Museum. A gable end of a tomb, which might have been connected with this relief, showed two sphinxes sitting, facing each other; emblems which were always associated with death and disaster. But there was another form of Lycian sarcophagus, that which was placed aloft on the top of a square pillar or stele, of which the Harpy Tomb in the British Museum was an example. In the figures on this tomb it was noticeable how the sculptor had carefully distinguished the effect of the transparent drapery which formed the under garment from the opaque drapery worn partly over it. They then had to skip two or three centuries to get to the next sarcophagi of any note — the Sidon set in the Constantinople Museum. Here there was a great change in the subjects and treatment; we had centaurs attacking Lapithæ with wine-jars; and the sphinxes on the pediment were seated back to back, a much less impressive attitude, with their wings towering up to the apex of the pediment; they had, in fact, almost ceased to be symbolic, and became merely decorative, like the griffins on the opposite pediment. The centaur subjects of the Theseum and of the Phigaleian marbles (Vth century) were exhibited as a contrast to those of the Sidon sarcophagi, representing a finer sculpturesque style. Another remarkable sarcophagus from the Sidon set was then shown, looking like a model of a Doric temple, with the inter-columniations built in, and each occupied by a figure in high relief. The probable meaning of these figures was that they represented relatives, who would from time to time visit the tomb. The most celebrated of all the Sidon sarcophagi was that named after Alexander, as it was concerned with his exploits, represented in crowded alto-relief. It did not follow, however, that it had any connexion with Alexander, but perhaps introduced his battles merely as historic events available for decoration. A comparison of the Sidon sarcophagi with the older examples showed that, though there was much more finish of execution, the sculptors had merely repeated older ideas of which they had lost the true meaning, and brought nothing of their own into the work but mechanical execution.

Water-colours at Messrs. Agnew's Gallery.

THE Thirty-eighth Annual Exhibition of high-class water-colour drawings at Messrs. Agnew's Gallery in Old Bond-street is a dream of delight. The amount of beautiful work by eminent painters crowded into this room forms a collection so rich that it is difficult to do justice to it. On the first wall a considerable number of rather small drawings by De Wint and Barrett are effectively contrasted. Barrett is a very good foil to De Wint, his graceful and pretty classical landscapes contrasting with the broad style of the greater artist, though it may be admitted that the peculiar greatness of style of De Wint comes out more forcibly in work on a larger scale. His "Gloucester" (6) shows a grand sky, however, and Barrett's "Morning" (17) a most beautiful treatment of distance. One of Barrett's, "The Haywain" (39), is different from any other work of his that we know, and curiously modern in feeling. Some of David Cox's smaller drawings suggest a doubt whether he did not carry freedom of execution a little too far at times, but he is seen at his best in "Blackberry Gatherers" (32). There are a number of works by Prout, showing him at his very best in his peculiar style, which, from the present point of view, looks as if it had been developed with a special regard to reproduction by chromo-

lithography; but what he aimed at he did thoroughly well. Cattermole is another name reminding one of the past; an artist who seems to have been sent into the world for the special end of illustrating Scott and "the buff-jerkin business." There is a good specimen of Girtin, and an early Turner, "Wakefield Bridge" (42), which reminds one of his debt to Girtin; there is also Turner's large "Kilchurn Castle" (41) with the rainbow. Copley Fielding is a reputation that hardly bears reviving; his stage trick of the sail against a background of thundercloud is too cheap; and E. Duncan, once also a leading sea painter, falls a good deal under the same condemnation; his "Ploughing" (69) is far more interesting than the class of works by which he made his reputation. Copley Fielding, too, redeems himself in "Near Shoreham" (111), a quiet landscape with a beautiful sky. W. Hunt's studies of boys and of fruit and flowers, all hung together, are a brilliant testimony to his thoroughness of execution and his versatility; no one who did not know his work would assign all these to the same hand. Thos. Collier is represented by some fine works, notably by "On the East Coast" (67), a small picture of the highest rank, and also, equally fine, "A Path Across the Moor" (119). Among the small works on the screens is Fred. Walker's beautiful little interior with two girls looking out of the window, called here "The Rainbow" (154); it used to be called "The Thunderstorm." There are a number of Birket Foster's, perfect in their style, but it is a bad style; and a little work by Linnell (187), which is worth them all. On the other screen are a number of small drawings by Turner, including some of his book illustration works, and a beautiful little drawing of shipping in "Portsmouth Harbour" (261) by Stanfield. There are many more that we have not space even to mention.

The Dudley Gallery.

THE water-colour exhibition of the Dudley Gallery Art Society represents the *juste milieu* rather than the highest level of painting, but the present exhibition (the fortieth) contains some works of real excellence, such as Signor Giampretri's "Terrace of Villa Lante" (46*), with its carefully painted row of ancient stone vases; everything in the drawing is complete and thorough in execution. Mr. L. Burleigh Bruhl's small drawings all have individual style and character. "Evening in a Cornfield" (1), by Mrs. Gregory, and "Blowing Fresh" (2), by Mr. David Green, are two excellent drawings to commence the list with. The characteristic of the Dudley Gallery exhibitions is that they consist too largely of works which, without any particular shortcoming, are also without any special interest; hence we naturally turn to those which emerge above this general level. Such are Miss Bernard's broadly-treated view of "Hayle" (147), Mr. Geo. Marks's "Evening Glow" (220), "Autumn" (294), and "Heather" (298), the last a beautiful little work. Mr. Sylvester Stannard's numerous drawings, including one very large one, are all good in a way, but it is in a mannered way, and not real nature. Miss Agnes Rudd's two little sketches at Walberswick and Blackeney (218, 219) are very slight, but they show a feeling for colour. Among other things to be mentioned are Mr. Walter Severn's "Gorse in Full Bloom" (200); Mr. Duassut's little miniature study of "A Cottage Garden in Kent" (193); Mr. Wells's Dartmoor views; Mr. Standen's "Borghetto, near Bordighera" (88); Mr. S. G. W. Roscoe's "Cottages, Landewednack" (116) and "Gorse in Bloom" (176), a real bit of light and colour; Mr. Vivian Rolt's "Lane near Crooked Common" (248), showing a very good water-colour style; Mr. A. Meyrick's "Study of a Herringboat" (252) and "Eyemouth Harbour" (170)—Mr. Meyrick paints ships well; and Mr. Tyndale's "Holton, near Oxford" (98), a small, carefully-executed view of a roadside house and trees.

The Holland Fine Art Gallery.

At this gallery there is on view a collection of pictures, chiefly landscapes and seapieces, by Mr. Charles P. Gruppe, an artist who is an American by birth, but is now working in Holland, and who has assimilated the style of the modern Dutch school as completely as if he had been a native of the country. Mr. Gruppe is an artist of no mean powers; all his paintings show a broad and artistic style and feeling, and some of them are very beautiful. We may mention especially a beach scene, "Bringing up a Herring Fisher" (37), which is admirable in tone and atmosphere, and only needed a little more decisive and detailed treatment of the ship to have been a perfect work; "Evening near Laren" (24), with the faint evening light on the horizon; "Gathering Wood" (36); "A Corner in Laren" (8), a delightful little roadside picture; and "A Fresh Day, Katwyk" (4), a seapiece with a very fine sky. One or two of the others recall Jacob Maris, and are not far behind him.

The Fine Art Society.

THE collection of water-colour drawings of Surrey, Sussex, Hants, and Wilts, by Mr. Wilfrid Ball, on view at the Fine Art Society's Gallery, is enough to make a reputation. We have seldom seen an exhibition of the works of one artist in which there was such a uniform level of excellence. These are landscapes in a delicate and finished style, yet preserving breadth. There are two indeed —"Now came still evening on" (57) and the large one entitled "A Surrey Common" (71)—which are in a different manner from the rest, as if the artist had been trying an experiment; and we do not like them so well as the others. But in the main this is a beautiful set of pictures of English landscapes. Among those that seem exceptionally where all are good, we may mention "Haytime in Surrey" (7); "Shackleford Common" (20); "The Village of Fittleworth" (23); and "Hurrying Clouds" (58). At the same gallery is an exhibition of drawings of English and Italian gardens by a lady artist whose name is new to us —Miss Ina Clogstoun—and whose drawings are an agreeable surprise. They are in a broader and fuller style of execution to Mr. Elgood's, and have not the same minute finish of detail, but in their own way they are perhaps equal to his as far as the flowers go. Miss Clogstoun does not, however, put in architecture as carefully and conscientiously as Mr. Elgood. But her drawings contain much exceedingly fine work as representations of the colour and character of flowers, and give her at once a position as an artist in this class of subject.

ADDITIONS AND ALTERATIONS TO TOWN HALL, SUNDERLAND.

THIRTY designs have been sent in for this competition, which, being an addition sandwiched between two important buildings, restricted the competitors, more or less, to a repetition of design, and turned the question into competitive planning. The sum allowed, exclusive of internal decoration, was 30,000*l.* Mr. Macvicar Anderson was the assessor.

The first premium has been won by Messrs. Wills and Anderson, with a scheme well ahead of the others in its solution of the problem. This is the only design in which the authors have realised the value of transferring the present entrance to a central position in the completed block. By clearing away the present entrance hall and staircase and introducing a large hall running with the long axis of the building, and having a staircase at either end, the scheme at once shapes into a symmetrical and cohesive whole, with two main galleries lighted by a continuous range in the crown of the vault. In the basement is accommodation for the education committee for truants, medical officer's laboratory, stores, and strong rooms. On the ground floor the borough engineer's offices are placed in the Fawcett-street front, and in the same front is a rather cramped cemeteries department, in which the present entrance is utilised. Facing the back are the medical officer's and electric light departments. On the first floor the front is occupied by the town clerk, committee-rooms, and the end of the reception hall, which has been transferred from its present position to the extreme north of the addition. The back accommodates the educational department. The reception-room is lighted at both ends and top, and the committee-rooms are conveniently placed *en suite*. On the second floor are sundry offices unclassified. Lavatories and water-closets are provided on each floor.

Externally, the addition is a repetition of the old work, and the whole is centralised by the introduction of another small tower, similar to the existing one, the new entrance being between the two. It is questionable whether the two towers are successful, and a more economical and dignified result could be got by transferring the present tower bodily to the centre over the new entrance. The feature of the design is the great central hall, shown (by a fine wash drawing) to be a dignified marble design of restraint and beauty.

The second premiated design, by Messrs. R. Hemingway and A. W. Bradshaw, of Nottingham, is based on an idea resembling that of the winners, but loses by using the central part for the cemeteries department, introducing a lighting area to the north. The retention of the old entrance, now obviously in the wrong place, is also a serious defect. The borough surveyor's and electric lighting departments are accommodated as in the first; but the drawing office of the latter is badly lighted from a very small area. The reception-room is placed to the front, and destroys the directness of the first floor plan. The lavatories and water-closets are inconveniently placed in the basement. The committee-rooms are badly arranged. A treatment of repetition is observed in the external design grouped as a main feature.

Messrs. S. G. Goss and Harold Burgess have been placed third, with a design scarcely worthy of its place. The present entrance is retained, and an extra one put in the new addition, leading to a badly-planned staircase. There is one main corridor. The general offices of both the borough surveyor and electric light departments are in the heart of the building, with very little light from small areas and glass screens. On the first floor the reception-room is placed on the north, and the committee-rooms are conveniently placed. The education department, to the back, is indifferently planned. Altogether the plan looks confused. Externally, the old work is repeated, but the new flanking feature fails in its purpose by being 13 ft.

narrower than its fellow. A very fine perspective, by a well-known hand, does not betray this fact, and is the only valuable drawing in the set. The internal detail is not satisfactory.

Next to this is a design by Mr. S. B. Russell, with an additional entrance and staircase. The surveyor's and electric light departments are not well planned, the drawing office of the latter is absurdly small, and a great deal of valuable space is absorbed by very large strong-rooms. The first floor has two main corridors, and is excellently arranged. Externally, the author has ignored the existing buildings and submitted a characteristic but unsuitable front.

Messrs. Hall and Phillips have tacked the new part to the old with indifferent success and made little or no attempt to pull them together. The elevation is designed independently, and is out of harmony.

Mr. F. E. Coates works out the problem much on the same basis, with an even less satisfactory result. This is one of the few schemes retaining the reception hall in its present position, and two ways are timidly suggested to get over the difficulty of communication between the old and new parts.

Messrs. W. and F. R. Milburn provide an extra entrance, and place the borough surveyor to the back, and electric lighting to the front. The reception hall is an unshapely room, with a huge gallery, and clearstory lighting. The design is elaborate without breadth. The authors submit an alternate design for the exterior, which is the more suitable.

Messrs. Vaux and Marks' strainers are a confusion of delicate drawing and colour with little meaning, unsuitable for a competition.

Many of the competitors have failed to realise the necessity of direct communication between the old and the new parts of the building and the proportions necessary to insure the effective lighting of the rooms.

Messrs. Cackett and Burns Dick submit the only design with a full second story to Fawcett-street, which is treated with considerable success.

Messrs. Brown and Spain have sent in two designs. The design marked No. 30 is deficient in lighting to the electric light general office, and the elevation is designed to harmonise with the adjoining building to the north of the addition, with which it has no relation. Design No. 8 is a better plan, with weakness in the somewhat scattered education department and inconvenient placing of the committee-rooms. The elevation harmonises with the present hall, and we think the design somewhat hardly treated in not being premiated.

Mr. J. A. Watson, with an indifferent plan, preserves the present building intact, and submits an interesting but unsuitable elevation, shown by a really fine perspective.

VIEWS OF ST. JAMES'S PARK AND AROUND.

MR. C. E. JERNINGHAM has lent for exhibition in the City Hall, Westminster, until the evening of next Wednesday, his interesting collection of maps and views of St. James's Park and the neighbourhood. Amongst the ground-plans is a copy of Ogilby's survey of old Westminster, showing, on the north side of the Artillery Ground, "The New Chapel," to the building of which Laud contributed 1,000*l*., together with some curious old glass. In the Rebellion Sir Robert Harley shattered all the windows, and Cromwell's troopers stabled their horses within the building. The church was rebuilt, after Poynter's designs, in 1842-3, and is now called Christ Church. Sir William Waller, the famous Parliamentarian General, and Colonel Blood were buried in the adjoining grave-yard. There are exhibited George Vertue's accredited reproduction, 1747, of the large scale plan of Whitehall Palace, *temp.* Charles II., views of the gardens of Carlton House—formerly the "King's Garden," of (old) Buckingham, or, more correctly, Buckinghamshire House, built in 1703, after Captain Winde's designs for John Sheffield, first Duke of Normanby and of the county of Buckingham, on the site of Arlington House, and of Marlborough House, as originally designed by Wren. An uncommon set is that of the interior of St. James's Palace, in colours, one of them depicting the interior of the chapel on the occasion of the marriage (in 1734) of the Princess Royal, daughter of George II., and William, Prince of Orange. Rosamund's Pond, in the north-west angle of St. James's Park, is represented by the print after Hogarth's painting; the pond is often stated to have been the scene of the suicide of Harriet Westbrook, the first wife of Shelley; but the pond was filled up in 1770, and, as a matter of fact, she drowned herself in the reservoir formerly in the north-east corner of Green Park. Whilst not containing anything of exceptional rarity, Mr. Jerningham's collection is worthy of a visit; the prints are conveniently displayed in separate frames hung around the Council Chamber.

SEWAGE AND SHELLFISH.

THE oyster scare of last year appears to have caused some searchings of heart among the members of the London County Council, and to have induced the Main Drainage Committee, which is, of course, responsible (under the Council) for the method of sewage-treatment and sludge-disposal now in use, to instruct its officials to make a careful investigation with a view to ascertaining whether the oysters and cockles obtained from beds in the estuary of the Thames are contaminated with London sewage or not. It is well known that the sewage of the Metropolis is treated with chemicals at Barking and Crossness, and that the effluent from the tanks is discharged into the Thames without further purification, while the sludge deposited in the tanks is removed by steamers and poured into Barrow Deep, a part of the sea about twenty miles below Southend. The first examination undertaken for the Committee was that of the river water from the Mucking lightship about twenty-one miles below Crossness, to a point three and a half miles below the Nore—a total distance of about eighteen miles—with Southend rather more than half-way down. Samples were collected at low water in mid-stream and near the southern and northern shores, at points about two and a half miles apart, and showed a regular and rapid diminution in the number of bacteria from the lightship to the sea. This is only what might have been expected. But whether samples collected at six tides in March furnish sufficient evidence to warrant the Committee's conclusion that "no danger can arise from bacterial contamination, at, or below, Southend" is another matter. The Royal Commission on sewage-disposal also made an examination of the Thames, and while the results accord in the main with those obtained by the Council, the conclusion is less dogmatic:—"These results do not support the allegation that the Kent and Essex foreshores beyond the Chapman light (about four and a half miles above Southend) are greatly contaminated by the discharge of imperfectly purified sewage into the Thames at Barking and Crossness." This appears to admit that contamination of some sort does occur in the neighbourhood of Southend. The London County Council ought not, however, to forget that there are bipeds as well as bivalves to be considered, and the question may well be asked, "What is the state of the river in the twenty-one miles from Crossness to the Mucking lightship?" Is there no danger here from bacterial contamination? And, if there is, when will the Council remove the danger?

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE BACTERIAL DISPOSAL OF SEWAGE FROM ISOLATED BUILDINGS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at 9, Conduit-street, W.; the President (Mr. Aston Webb, R.A.) in the chair.

The minutes having been taken as read, Professor Frank Clowes, D.Sc., read a paper on "The Bacterial Disposal of Sewage from Isolated Buildings," of which the following is an abstract:—

The paper dealt mainly with the application of the biological method of treatment to the sewage from the new colony established at Horsham in the buildings of Christ's Hospital, erected by Messrs. Aston Webb, R.A., and Ingress Bell. The system adopted consists in passing the sewage slowly through a depositing, or so-called "septic," tank, and allowing the outflow from this tank to be dealt with intermittently in coke-beds. The effluent from the tank, after having been treated once in the coke-bed, passes into a running brook, flowing as a matter of convenience over a short stretch of grass-land on its way.

Describing the system of biological treatment and the method of adapting it, the author explained that the general advantages secured by the system are that it affords an inoffensive and non-putrescible effluent, and at the same time largely reduces the amount of sediment or "sludge" from town sewage which has to be disposed of; in the case of domestic sewage it even removes the sludge altogether.

There are two recognised methods which expose the sewage liquid for the action of aërobic bacteria. The "continuous method" provides for the liquid which overflows from the septic tank being continuously sprayed over the coke-beds, through which it constantly trickles and then flows away; whilst the "intermittent method" provides for the coke-bed being filled with the liquid and then drained away after it has remained in the bed for a few hours. Both methods, properly arranged and worked, yield a perfectly satisfactory effluent, and one or other should be chosen according to the conditions under which the sewage is to be purified; where the fall of ground is sufficient the continuous treatment might probably have the preference.

The plant for continuous treatment would be more expensive than that for intermittent, but the cost of working would be less. The extra cost of working the valves in the intermittent system may be reduced where there is a man about the place engaged in other work who can attend to the valves; or the action may be made automatic.

Summarising the general results obtained, the author stated that the treatment has now been in operation at Horsham for over eighteen months, and that not a hitch has occurred in the working of the plant. The solid fæcal matter of the sewage is absolutely disposed of in the septic tank, and no deposit has formed upon the bottom of the tank. The fear expressed that this tank might become offensive has been proved groundless, since the ventilators in the roof of the tank and the open manholes emit no offensive smell, and the smell of the effluent itself is slight and only noticeable in the immediate vicinity of the tank. The final effluent liquid from the coke-bed is usually slightly turbid, but is free from any offensive odour; it possesses only the smell of freshly turned garden mould, and this is the odour usually emitted from wholesome effluents.

An effluent of the character of that at Horsham actually improves the condition of the water of a brook which has been fouled by sewage and cesspool discharges. The experience obtained in the construction and working of the plant in question has given assurance that it is suitable to deal with the sewage derived from any isolated building without giving offence. Under proper management, the sewage effluent which it discharges is innocuous to fish, and can never become offensive when it is discharged into a water-course.

The author gave details of the construction of the plant and the method of using it. The sewage flows by gravitation into a small receiving chamber and passes through a coarse screen into the septic tank. The tank is constructed in duplicate in case of accident or necessity of repair, each part being capable of retaining a twenty-four hours' flow of sewage. The tanks are covered in and provided with tall vertical ventilating shafts similar to those employed for the ventilation of sewers. The tanks were formed by excavating the soil, and were then built in brick and rendered inside with cement. Both the inlets and the outlets of the tanks consist of elbow pipes, the ends of which are beneath the surface of the liquid within. The solid fæcal matter rises to the surface of the liquid, and the arrangement of the elbow pipes not only insures that this matter shall remain in the tank during its dissipation as gas and liquid, but also that it shall not be disturbed meanwhile by the flow of the liquid.

The effluent passes from the septic tank by an exit and flows along an open channel on its way to the coke-beds. This channel was constructed in a succession of steps, so that the liquid, by falling over weir-walls, might be freed from much of its dissolved gas and might become aërated. Aëration has since been more fully secured by letting the effluent fall through perforated trays before passing over the weirs.

From the culvert the liquid flows into a tank filled with small graded hard coke. The liquid is distributed over the coke surface by flowing along branched "grips," which are

excavated in the surface of the coke. The grips are lined with fine coke, which serves to filter off the coarser particles and to prevent them from getting into the bed. This fine coke is raked off at intervals and replaced by similar fresh material. As soon as the coke-bed is full to the upper surface of the coke, the flowing liquid is diverted into another similar bed. The bed is then allowed to stand full for two hours, after which the liquid contents are allowed to flow away through drainage arrangements provided on the floor of the tank. This liquid constitutes the purified sewage effluent.

The tanks for containing the coke are constructed in a similar way to the septic tank, but are not covered in. They have square drainage channels provided in their floors, which are covered with perforated iron plates. Six of these coke-beds are provided, and they are used in succession. Three of them are filled and emptied each day, the liquid remaining in the bed for two hours, and the bed being allowed to stand with air in the interspaces of the coke after its liquid contents have been discharged. Two of the remaining beds receive the effluent flowing continuously through them from 5.30 p.m. to 6.30 a.m., a period during which the sewage is scarcely foul and comparatively little purification is necessary. This flow is provided in order to maintain the proper bacterial condition of the coke while the bed is not doing duty.

It is found that the amount of purification produced by a new plant increases for a considerable period, and that, so far from the tanks requiring renewal or cleansing, they become increasingly efficient as their age increases if they are worked with regularity and are left undisturbed.

This "natural" or "biological" process is identical with that which occurs in the treatment of sewage on the land in sewage farms, but the biological plant causes no offence, and requires less space and is more satisfactorily under control than the sewage farm. It compares favourably with the chemical processes of treatment, which can never effect economically a purification equal in degree to that secured by biological action, and which produce a much larger amount of sediment or "sludge."

Dr. Fowler (Manchester) said he was pleased to have been asked by Dr. Clowes, and subsequently by the President, to be present. He had a small part in the initial stages of the installation at Horsham, and it was very satisfactory to know that it was going on so well. There were a number of points he thought of speaking about in connexion with small installations which might perhaps be of interest to architects, and first of all it occurred to him that architects were singularly fortunate people in that to them in a large majority of cases—it might seem paradoxical to say so—the sewage problem did not exist. The reason was that the sewage problem had come to be more and more a question of cost. There was no doubt whatever that by modern methods it was possible to produce an effluent of any degree of purity up to potable water if necessary. He knew an installation which was being started now in the vicinity of St. Petersburg at a small town where the Tsar was accustomed to go for his summer holidays, and where an outbreak of typhoid made the inhabitants exceedingly anxious that the sewage should be thoroughly purified. He understood that they contemplated an installation there something like the one at Horsham, but there was also to be disinfection by ozone; so that where money did not much matter they could do what they pleased. There was no doubt that installations for country houses and comparatively small places such as architects were frequently called upon to deal with might be made very efficient without any very serious question of cost arising, for the reason that the addition of a few pounds to the cost of the installation might nearly double the factor of safety. He would say that generally it was well to have the largest factor of safety within limits that they could. Dr. Clowes had very properly emphasised certain limits which did exist, more especially in the size of the septic tank. He thought there could be no doubt whatever that it was possible to have what might be called over-septicised sewage. There was a case in point in the last report from Massachusetts on the Andover system. The septic tank experiments, reported upon for several years, had now been discontinued because it was proved that sewage which had travelled a long way in the sewer and remained in the septic tank had become over septicised and putrid, and was in consequence very difficult to purify. He had had a similar case under his own observation in some works which were laid down for a considerable district. But the sewage was admitted to the tanks when only a small portion of the district had been connected up, and the whole of the tanks were filled, as there was some apprehension as to whether the walls in their green state would stand. The flow was very slow, and had become a nuisance, which was undoubtedly because the sewage was passing slowly through the tanks, and there was a development of sulphuretted hydrogen. They would see, therefore, that there was a limit to the size of the septic tank, and it was possible—although not so likely—that there might be some limit to the size of the beds. He had known a case in Manchester where they had started a bed a few months, and then, owing to construction work, they had to stop it for several months, and they found that it was practically a new bed when they started again; but he did not think that would occur in the ordinary way if the bed had had time thoroughly to mature. That, however, was a moot point. It was well to have a good margin, such as was the case at Horsham, where they had only perhaps to fill the beds once a day. A little case came under his notice which might be interesting with regard to a country house where he was asked in a friendly way to look over the plans, and where he took care that there was this factor of safety. He wrote to the owner of the house the other day and asked him how the installation was getting on. The owner had had three years' experience, and he said that the effluent all that time had passed to a little pond near the public road and there had been no complaint whatever. The only difficulty that gentleman had had was with a certain amount of scum which got into the exit pipe of the tank, but that was easily removed. The owner wrote once in great anxiety thinking that his tank was completely filled up with solid matter, and he (the speaker) suggested that what was the matter was that the solids had floated to the top and formed the scum under which very vigorous bacterial action was going on. The owner investigated and found that this was the case, and removed the scum and found everything right. That was practically all that had had to be done to the tank in three years, and the effluent from it passed on to one or two cinder beds that were only a few cube yards in size. In this case, as it would otherwise involve a certain amount of complication, it seemed better that it should be allowed to trickle continuously through, and this was done with an ordinary little perforated zinc tray. All that was done was that the gardener went down and turned the flow from one side to another, and, having allowed a plentiful margin of cubic space in proportion to the amount to be dealt with, there was no difficulty in the purification. The whole difficulty came in when, as in the case of a great city like Manchester, they had to get the utmost out of every cube yard of space; then they had very carefully to consider the question of cost right through; but any little difficulties of distribution or anything of that sort were all neutralised, it seemed to him, if they had a plentiful margin of safety, and in most cases that could be readily allowed for in small installations at a comparatively insignificant cost. Of course, in the case of a country house, an extra 5*l.* might add, perhaps, 25 per cent. to the cost of the whole installation, and if they came to work that out for a big town it ran into hundreds of thousands, and that was where the difference came in. Then, as regarded the cost of the installations generally, that was a matter which would vary according to the conditions, and, as Dr. Clowes very rightly said, whether they should have intermittent methods or continuous methods was very largely a question of conditions—of the fall available and so forth. He believed himself, especially where they could have these margins, that the very simplest methods were always the best, and they could get quite as efficient results by some simple methods of distribution. For instance, they could have the method, as Dr. Clowes had pointed out that night, of just allowing the sewage to trickle through a certain amount of fine material on the surface as had been done at Friern Barnet for years. Methods of that sort gave quite as good results, and were liable, if possible, to less accidental interference than more complicated mechanism. That was his own feeling, and it was a conclusion which had been come to by Professor Dunbar at the Hygienic Institution at Hamburg, who had done some of the best Continental work on this subject and with whom he had had a great deal of correspondence. The form of filter which was recommended for small installations was made up of about 6 in. to 9 in. of fine material on the top with a rough, coarse material underneath, and the fine material gave them two things—it gave them distribution and it gave them what had come to be known as absorption; that was the action of the medium which was not often referred to in English literature on the subject, but it was a subject undoubtedly of great importance. There was no doubt that the physical effect of the medium was of great importance, and that was where the question of size was always to be considered. It was possible, by taking absolutely sterile clinkers of a certain size and passing sewage through, to get very considerable purification. They knew that dyes and so on would be taken right out of solution by purely physical absorption, and that matters like peptones and albuminoids were taken out purely by the absorptive action of the medium. That very soon ceased unless the biological action succeeded, and then the absorbed matter was oxidised by the action of the bacteria. This oxidising effect was of very great importance in connexion with the treatment of isolation hospitals, and that was a point which would probably be of interest to the meeting. The difficulty often arose as to what was to be done with sewage which was specifically infected by typhoid or any other infectious disease. Of course, the mere passing through the beds, as had been abundantly proved, was no real safeguard as regarded the removal of pathogenic organisms, but it had been found that it was possible to absolutely sterilise such sewage before putting it on the beds by means of chloride of lime, and after such sterilisation it could be put on bacteria beds, the chloride of lime was oxidised to chlorate, and the purification went on, if possible, more vigorously. If chloride of lime was used according to the Hamburg experience, it was possible to sterilise the sewage and free it from danger before putting it on the contact beds, and for such work they preferred the simple form of percolating bed he had described—viz., first a fine layer, after passing through which the water percolated through the coarse material and got thoroughly oxidised. He was told by Dr. Dunbar that about 50 per cent. of the change took place in the top layer. He believed that the right use of fine material on the top would help in many cases towards a very simple solution of many small sewage problems. He knew himself of a small works near Manchester, which was made of a sand top with coarse material underneath, which had been going on with excellent results for thirteen years, with regard to which only an occasional scraping of the sand had been required. Such a method as that seemed to him to be excellently suited for a small installation. In Manchester they had these grips at the top of the beds, and removed a large amount of sludge from time to time, which was simply distributed, and did not cause any sort of nuisance at all, and the labour in doing that was not really very excessive. He had had some costs got out, and, up to the present, for the whole year the cost had come out very well. They found that it came out at a cost of about 3s. per million gallons. Of course such figures were only of use if used judiciously. What could be done in a huge town with millions of gallons could not be done with small installations; but still the labour involved in the occasional scraping of beds in small installations was not excessive. The cost of construction again varied according to the necessities of the case. One heard all sorts of estimates of one kind and another, but he might say that their little experimental septic tank installation in Manchester for about 20,000 gallons cost them, everything included, something under 600*l.*, but he had heard of installations which had cost a great deal more. It all depended upon a variety of local conditions, which had always to be taken into account.

Mr. Harold Griffiths said there was no doubt that the methods of sewage disposal which did very well thirty years ago were quite out of date at the present time, and he was delighted to think that the Institute had had a paper of so practical a nature, dealing with so important a subject as the scientific disposal of sewage, by Dr. Clowes. It might be thought by some, and by what he might term the "shining lights"

of the profession, that the disposal of sewage was utterly beneath their notice, but he ventured to suggest that everything which affected the complete construction of a building should come within the scope of the architect. There were one or two points in regard to which he would like, for the benefit of himself and perhaps others, to have a little additional information. The question of cost had been mentioned several times. He would like to say that at present he was laying down a sewage installation as described that night for a Surrey mansion. The difficulty he had there was that when the family were in occupation there was a considerable amount of sewage, but when the staff only were there only about one-tenth of the sewage had to be dealt with, and it made it difficult to fix on the proportions of the septic tank and the bacteria beds. As regarded cost, he considered that with a house which had approximately fifty rooms, and housed about sixty or seventy people, the cost would be about 130*l*. That was a small sum, but the amount of sewage to be dealt with was small. He would like Dr. Clowes to tell them how long the sewage should remain in the septic tank before it flowed to the bacteria or filter chamber. It had been said that if it remained very long it got too putrid, but there must be a time before proper chemical action had taken place. Therefore, it would be very valuable if precise time were given, so that they should know how long to allow it to remain in the tank before allowing it to go on to the bacteria beds. Coke had been mentioned as the best filling material, but he would like to know Dr. Clowes's opinion as to ballast. The next point was the size of the filling material. He heard, with some astonishment, from Dr. Fowler that sand on the top was a very great advantage. If that was so he would be delighted to use it, but it was the first time he had heard of it. Further, he would like to know whether it was necessary to repeat the process twice in a day, and, if so, at what time it should be done. Where there was little sewage for disposal, how many days could they go from one irrigation to another without destroying the colony of bacteria in the chamber? It appeared to him that the bacteria must be nourished, and he would like to know as to what length of time, or how frequently, one would have to repeat the process of keeping the bacteria alive in the chamber. Then what became of the grease for the washing up? It seemed that it was proposed to run the grease into the chamber in the ordinary way, and he wished to know whether that would be purified, or whether it would clog the filling material in the chamber. He would, if he might venture, suggest that for a small scheme a perforated trough of oak would be better than the method adopted at Horsham for distributing the sewage. It appeared to him that the sewage would immediately commence to sink at the end of the chamber where it entered, but if the perforated trough was adopted it would distribute the sewage all over the chamber, and it would be filled at one and the same time. Did he also understand correctly that two hours was the proper time mentioned for the sewage to remain in the bacteria chamber? He always understood that the time was four hours.

Mr. F. J. Willis (Secretary of the Royal Commission on Sewage), who was invited to take part in the discussion, said he was afraid he could say little about the matter that night. He had been much interested in Dr. Clowes's paper, because it was from such men as Dr. Clowes that the Royal Commission had to get their experience. There were, however, a great many problems which were not yet decided, and it was an advantage to have a discussion of that kind.

Mr. Langton Cole remarked that there had hardly be any mention of automatic action, and he would like to know whether, in dealing with the sewage of an ordinary-sized country house, it was a desirable thing to go in for one or another of the automatic arrangements which were brought before them. The question of stagnation also applied particularly in the case of a country house. What was the best method of getting over the real difficulty of a house being occupied only for a portion of the year? Was it well to leave the bed to itself, or should some special arrangement be made for dealing with it?

Mr. Penfold observed that as a country member he had come to the meeting to get some information. He was preparing a scheme for the sewage disposal of a small infectious hospital, where they proposed to have an automatic system, not intermittent; but he was rather surprised to hear Dr. Fowler remark that he was doubtful if that effluent was quite safe and that chloride of lime should be used before the sewage passed into the beds. He would like to know how Dr. Fowler would apply the chloride of lime before the sewage passed into the septic tank.

Dr. Armstrong thought that both the President and himself viewed Dr. Clowes's appearance with considerable satisfaction, because they were primarily responsible for the adoption of this system at Horsham. He, as one of the Governors of the school, very carefully considered the question, and it was a very difficult problem to deal with. Personally, after various visits under Dr. Clowes's superintendence, he had little doubt as to the desirability of adopting the system, but, although he had never before ventured to hint at such a thing, he felt that the President was a little nervous at the time, and therefore it was a great satisfaction to know that the scheme did work successfully. He thought that was a proper time to tender Dr. Clowes their most grateful thanks for the assistance he had rendered them. From the scientific point of view this system of sewage disposal was one of extreme interest. In the first place it was a justification of the cesspool system. They got rid of the old cesspool and thought it was an abomination, but they were coming back to it, only on a larger scale, with the precaution that they did not draw immediately on the tank for their water supply. That really was the only distinction between the modern and the old system. In the old system the well and the cesspool were placed side by side. Now they were careful to avoid placing the well near the cesspool, although perhaps Dr. Fowler had foreshadowed that they might be prepared to drink sewage properly purified by a system. When they considered what was going on in these tanks it was extraordinarily interesting. It showed the difficulties which the architect laboured under in these times when he was called upon to be a master of all trades, but in the second place it did emphasise the importance of an architect receiving a thorough grounding in scientific subjects and a proper training in scientific knowledge. He did not know that he had anything to say with regard to the technical side of the problem. He thought, however, that many would like to visit the installation at Horsham, which had been carried out with that elegance of design which was characteristic of Mr. Aston Webb. It might perhaps be a trifle expensive, but he believed in the long run it would be agreed that the money had been spent to the greatest possible advantage.

Mr. Osborne Smith seconded the vote of thanks, and, in doing so, said that he would be glad if Dr. Clowes would supplement his remarks in telling them a little more how the laundry refuse was to be dealt with, for the washing for a tnousand boys must be considerable. He would like to know whether it was turned on to the beds with the rest of the sewage, or whether it was treated separately. There was another difficulty sometimes encountered by some of them who had to do with houses in the country, which was that sometimes the beds had to be put in such a position that they had to be covered. He would like to know what the exact effect of the covering of beds was, because he believed in some cases it had a disastrous effect.

Mr. King asked what was the reason for the tanks at Horsham being ventilated. Up in the north he had done two similar installations and they did not ventilate, and they had only about 4 in. of crust on the top. They understood that that crust was composed of cannibals eating each other, and so getting rid of the solid matter.

Mr. Max Clarke said that he had put up a small bacteria tank in 1893, but, unfortunately, at that time he did not know anything about the secondary or coke beds, so he allowed the effluent to run from the tank along a trench cut in the ground, and that had been going on with very successful results. The installation was for a small house, with accommodation for about six persons. He was conversing with a man last year who told him that he had just come from inspecting a very large installation of this nature for a public institution, and he said that the scum had grown right up through the drains and the soil pipe with such disastrous results that the whole system was blocked up. He had been unable since to find out anything more relating to this particular catastrophe, but he would like to know whether anything of the kind had come within the knowledge of Dr. Clowes.

A gentleman in the body of the hall asked what should be done in the case of a perfectly level site where they could not get a fall.

Mr. F. Lishman said that a thing which had occurred to him when looking at the illustrations was what would happen in the case of frost. He had seen the effluent spread over these beds, and he had felt a little uneasy in case of frost. They must remember that in recent years, since this system had become somewhat common, they had had no frosts at all of any severity. Supposing they had frosts of three, four, or five weeks' duration, which was the case in 1891 and 1892, what would happen in the case of the Horsham School installation, or in other places?

The Chairman thought they would all agree that they had spent a most useful and instructive evening. He agreed with what was said that they as architects should certainly keep up with the science of the disposal of sewage, as much as any other part of their elaborate work. As Dr. Armstrong had said, he, as one of the Governors of Christ's Hospital, had a great deal to do with the system adopted at Horsham, and it was also at Dr. Armstrong's suggestion that they were fortunate enough to get the help of Dr. Clowes in carrying it out, and it was through Dr. Clowes that they were again fortunate to have further help given by Dr. Fowler, of Manchester. He felt that he was under great obligations to those three gentlemen in that particular matter. He felt that he ought rather to apologise that for a second evening this particular school at Horsham had been under discussion; but when he found that Dr. Clowes was willing to give them a description of the work which he had done there, he thought he would not have been doing the Institute a good turn if he had not encouraged him in giving his paper. Down at Horsham they had rather a difficult task, because the nature of the land there was not very suitable for the disposal of sewage over the land. Horsham itself had tried that principle, and, in fact, had a sewage farm not very far off, and it became essential that any effluent which was passed from this particular congregation of individuals, which numbered over a thousand, should be as pure as it could be made, or, undoubtedly, the Institution would have got into serious trouble. It was, he thought, a test of its success that for eighteen months that effluent had been passing away, without annoyance to anyone who resided in the district. Before it was decided upon Dr. Clowes took him down the river to Barking, and certainly the effluent he saw there pouring in tons into the Thames was a very different effluent to that discharged from the sewage which had been treated on the methods described by Dr. Clowes. He had had the advantage some time ago of hearing Dr. Clowes speak on a similar subject at the Royal Institution, and he said then with reference to these bacteria—which he supposed he might say even Dr. Clowes did not know all about—that they could be exposed to an extraordinary amount of heat without affecting their vitality in any way, but that when they were exposed to the sun they turned up their feet and died. That struck him as a wonderful example of the beneficent use of the sun's rays. It was one of the principles they had gone on at Horsham, viz., to call the sun in in every possible way to preserve the health and strength of the boys who occupied that place. With regard to the bacteria, although he knew the installation at Horsham very well, he confessed that he could not recognise any signs of the presence of those bacteria which had been shown on the screen. Dr. Clowes weighed them and told them how many there were to the inch, but he was not at all sure that they always thoroughly well understood what exactly took place with regard to these organisms. With regard to installation to private houses, which, as Dr. Fowler had told them, affected architects very largely, he had found the same difficulty arising from the unequal flow in these small installations. In one case he had an automatic system which was supposed to throw the matter first on one bed and then on the other when the first was filled. That worked very well up to a certain point, but when the house was full of visitors,

and an extra number of baths, etc., were required, and an extra amount of water had to be dealt with, the automatic system was no good at all. Whether that could be improved or not he did not know, but it was certainly one of the things they must look to for assistance from gentleman like Dr. Clowes and Dr. Fowler. He would like to say how very much indebted they, as architects, must always be to scientific men who were good enough to take an interest in these matters. We (architects) could not pretend to originate these things, and all we could do was to carry out, to the best of our ability, the suggestions which those gentlemen gave to us. As architects we did not profess to be experts in these matters, and he thought every wise architect would call in a man who was experienced in such matters before putting his client to an expense in regard to the disposal of sewage. In conclusion, the President said he was sure they would include in the vote of thanks Dr. Fowler and Dr. Armstrong.

The vote of thanks having been heartily agreed to,

Dr. Clowes, in reply, said that he had had no experience with regard to automatic arrangements, and perhaps Dr. Fowler might answer that question first.

Dr. Fowler said it was a somewhat delicate question on which to speak publicly, because there were a great number of these automatic apparatus, and each one of them, of course, had some special feature, so that all he could say was of a general character, and rather to the effect that the use of automatic gear—the economic use of it—depended upon the amount of labour they could save. If they could save practically all their labour, and could dispense with men entirely, they would of course save 100 per cent., but when the installation got bigger and bigger, and they were bound to have a number of men about, then he was bound to say from his experience in Manchester that the use of automatic gear became less and less. He had a great wish to see everything done as nearly as possible by machinery, but when one found that one man could control a large number of pipes one began to think the game was hardly worth the candle. The question was not really the acreage they had to control, but it was the flow they had to control at a given moment. They had in Manchester seventy-two acres to look after, but they had only got one million gallons per hour, and one or two men could very easily distribute that amount of water about the place by means of sluices. It was not as if the whole 26 million gallons came in at once. At the early stages of the Manchester scheme there was talk about them wanting a thousand men, but they had found that only a certain amount of water came down in a given time, and if they had supplied all the beds with expensive machinery they would have had a very large proportion of the plant simply lying idle for the greater part of the time. What they had to consider in all these cases was the really economic course to pursue, but he was sure that any automatic gear adopted must be of the very simplest. It was possible to devise highly ingenious arrangements of syphons and pipes, and so on, which would act exceedingly well in putting clear water from one tank to another, but with sewage it was a different thing. Sewage produced growths in the pipes through which it flowed when there was no access to the air No one without experience could realise what it could do. He had seen pipes of three inches diameter through which sewage had flowed which had become completely blocked with fungus.

The President: That would account for the case mentioned by Mr. Max Clarke?

Dr. Fowler said it was quite conceivable that the case mentioned by Mr. Max Clarke was due to the sewage flowing through the pipes where there was no access for air. Any automatic gear if adopted should be free from small pipes or anything of that kind which could get out of order. It should be something of the very simplest—a mere tipping bucket, or something of that kind.

Dr. Clowes said that he would first try to deal with the question asked as to providing for a regularity of flow, and how to provide for the absence of a family altogether for a mansion when the sewage became reduced to a very small amount. At Horsham in the first long holiday they had sore trouble from the fact that the flow almost ceased, and they were only able to meet that by turning the water supply through the whole system. He thought that was the only way of dealing with that particular case.

Dr. Fowler suggested that in cases where there was great variation it would be possible to allow the sewage to pound up to some extent in the tank, and allow it to flow away afterwards.

Dr. Clowes said the question was asked as to the length of time the sewage should remain in the septic tank. It was unwise to allow it to remain for a longer period than twenty-four hours. Very shortly after that it began to undergo a foul change which would lead to the tank becoming a nuisance. They had had septic tanks at work for many years in London, and they gave about six or seven hours only for the passage of the sewage through the tanks. But, of course, London sewage was different from the sewage of these private houses. It had been a long time in its passage and underwent a certain amount of change in the sewers. He certainly considered that more than twenty-four hours was highly undesirable. As regarded the material for filling the bed, they found that nothing was quite so efficient as coke. Ballast had been used successfully, and clinker—the hard clinker from the boiler furnaces—broken brick, and broken "saggars," the rough clay vessels in which potters burned their clay. All those had been successfully used, but none of them with quite so good a result as coke. With regard to the spacing of the two fillings in the twenty-four hours, ideally they should be separated as widely as possible, but, as a matter of convenience it was generally found that the two fillings took place during the daytime, because it was not economical to have a man kept late into the night in order to place the second filling at its proper time. With regard to feeding the bacteria at regular intervals it was suggested that it was necessary that the bacteria should receive a supply of nutriment. It was not, however, absolutely necessary to supply them with nutriment. They had found that for a week or a fortnight the passage of pure water through the beds seemed to maintain the bacteria in condition, and that they began their efficient action directly the sewage came in afterwards. The grease would disappear entirely in the septic tank. It would rise with the other solid matters which formed the scum, and in that scum it would be dealt with efficiently by the bacteria and would often aid the change. At Horsham the grease was separately dealt with. He was told by the bailiff in charge that all the laundry water was passed through vessels filled with common flints, and the liquid which passed away did not go through the installation for the treatment of sewage, but was passed off separately. It was suggested that a perforated oak trough might be better than the grips, as the latter did not carry the liquid through the length of the bed. As a matter of fact, they found that the system at Horsham ensured the liquid being distributed without any trouble. He mentioned two hours as being allowed for the aeration of beds, and he thought that that was sufficient, but there was no objection to that period being extended to ten or twelve hours or even more. There was no doubt that the main part of the purification was carried out in half an hour—more than 50 per cent. of it; but they generally gave two or three hours, because a certain amount of purification went on during that time, but afterwards there was practically none. He did not know where covered beds would be necessary.

Mr. Osborne Smith said it might be that the site was limited, and they could only put the beds in a position where they might be noticed by their smell.

Dr. Clowes said that these beds did not smell. If there was any question of hiding them, there would be no objection to a raised cover which would be open at the edges, but the coke beds must have aeration. The sun would not have any effect, as it would not penetrate sufficiently. Dr. Fowler had referred to the stopping of the outfall, and he believed that scum would do it as well as fungus. It might very likely have happened at Horsham, but the man in charge was told every now and then to probe it to ascertain its thickness, and it it got near to the opening of the elbow pipe to divert the sewage into the other septic tank, and in that way they had never had the slightest trouble. Where an absolutely level site had to be used, pumping must be resorted to. Frost was really not troublesome. A sewage farm, of course, was frequently thrown entirely out of action by severe and long-continued frost, but sewage coming underground was always at a temperature much above freezing point, so that there was always a comparatively warm liquid coming on to the bed.

Mr. E. Pike, chemist at the northern outfall, said that in 1895 there was a thin coating of ice on the beds at Barking, but bacterial action was not interfered with.

Dr. Clowes said that the President had remarked that he was not familiar with the organisms thrown on the screen, but those he had shown were not Horsham individuals at all. It reminded him of the town councillor in a town whose water supply was criticised, and it was reported how many bacteria there were per cubic centimetre. The councillor thought it was a slander on their supply, which came from the river, and he got up at the next meeting of the Council and said he had stood the whole day on the bridge contemplating the stream and had not seen a single bacterium. Personally, he was glad to advise as to the small installation at Horsham. They had been working at the matter for some years at the London outfalls, and the results arrived at were pretty final, and they stopped their experimental work. He was much interested, too, and was glad of the opportunity of having a small plant working on the system which he could continually observe, and from which he could still learn a good many useful facts.

The Chairman announced that a special general meeting for the election of the Royal Gold medallist for the ensuing year would be held on Monday, February 29. The meeting would be followed by a business meeting for the election of members and other purposes. The following resolution would be moved on behalf of the Council—"That after December 31, 1906, every candidate for the Fellowship shall be required to have passed the examination or examinations qualifying him as an Associate; but that in exceptional circumstances the Council shall have power to dispense with such examination or examinations. Further, that during the intervening period the doors of the Fellowship shall be opened wider than at present, so that no reputable practising architect desiring to join the Institute shall be debarred from doing so." Also the Council would propose certain amendments to the suggestions for the control of public competitions.

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Lord Monkswell, chairman, presiding.

Loans.—On the recommendation of the Finance Committee, the following loans were agreed to:—Battersea Borough Council, 11,710*l.* and 50,234*l.*, for paving, housing, etc.; Camberwell Borough Council, 16,958*l.* for purchase of property for housing purposes; Hammersmith Borough Council, 6,760*l.* for street improvement; Lewisham Borough Council 24,000*l.*, for provision of burial ground; and Poplar Borough Council 15,030*l.* for paving and channelling works. Sanction was also given to the following proposed loans:—Hackney Borough Council 22,775*l.* for contribution to street improvement, and 500*l.* for contribution to cost of reconstruction of bridge; Islington Borough Council 1040*l.* for electric light installation; Kensington Royal Borough Council 27,098*l.* for erection of dust destructor; and Lambeth Borough Council 25,025*l.* for purchase of a site for a town hall.

Improvement: Tower Bridge Northern Approach.—The Improvements Committee recommended, and it was agreed, that the supplemental estimate of 195,000*l.* submitted by the Finance Committee be approved; and that additional expenditure on capital account, not exceeding 195,000*l.* be sanctioned in connexion with the formation of the northern approach to the Tower Bridge, authorised by the London County Council (Improvements) Act, 1897.

Factory and Workshop Act, 1901—*Means of escape in case of fire from factories, workshops, etc.*—The Building Act Committee reported as follows:

Under the provisions of the Factory and Workshop Act, 1901, it is the duty of the Council to see that each factory or workshop situated within the administrative county of London, in which more than 40 persons are employed, is provided with such means of escape as can reasonably be required in the circumstances of the case. On May 6, 1902, we submitted a report as to the progress that had been made in the work devolving on the Council under the Factory and Workshop Acts, 1891, 1895,

and 1901, and we think the Council will be interested to know what progress has been made since. We therefore submit the following return showing the state of the work on December 31, 1903 :—

Cases on Council's register.		Number of cases in which means of escape have been provided to the satisfaction of the Council.		Number of cases with which the Council cannot deal by reason of not more than 40 persons being employed when the premises were first inspected, or the number having been subsequently reduced to 40 or less.	Number of cases remaining to be dealt with.	
Origin.	Number.	Old factories, etc.	New factories, etc. (certificate cases).		In hand (in various stages).	Means of escape not yet formulated, but preliminary classification and inspection made.
Cases notified by the Home Office..	2,247	299	15	669	216	1,048
By notification from other sources..	228	36	—	82	68	42
Voluntary proposals..	154	28	—	30	93	—
Applications for certificates.. ..	451	—	194	28	229	—
	3,080	363	209	812	606	1,090
		572				

As the result of the preliminary inspection of the outstanding 1,090 cases it is found that there are :—Dangerous cases, 264 ; cases requiring early attention, 129 ; cases not immediately urgent, 107 ; cases with which the Council cannot deal owing to not more than 40 persons being employed, etc., 590.

In the period between the coming into operation of the Factory and Workshop Act, 1891, and March 31, 1901, 1818 factory, etc., cases were notified to the Council, and by the latter date 798 of them had been, or were being, dealt with. Since then we have adopted the system of having a preliminary inspection made of all cases notified to the Council, as soon as practicable after the notification has been received, and by this means any cases which do not come within the scope of the Act, and with which the Council consequently cannot deal, can be removed from the list and the most dangerous cases dealt with without delay. In the period since March, 1901 (less than three years), inquiry has been made into 2,282 cases, and disregarding the 590 cases which, for the reasons stated, do not come within the scope of the Act there remain about 500 cases with which the Council has to deal, and in which it has not yet formulated its requirements.

During the past nine months the progress that has been made is as follows :—

New factories and workshops where means of escape have been provided to the satisfaction of the Council, and in respect of which certificates have been issued	45
Old factories and workshops in which the Council's requisitions have been complied with	37
New factories and workshops—Applications for certificates	50
Old factories and workshops in which the Council has sent requisitions requiring proper means of escape to be provided	78
Proposals to comply with requisitions or deviations from proposals already submitted	219
Factories dealt with, or being dealt with, by the Council where fires have occurred during this period	13
Cases with which the Council cannot deal, by reason of not more than 40 persons being employed when premises first inspected, or the number having been subsequently reduced to 40, or below, etc.	103

It will be seen that the number of cases in which the Council's requirements have been actually completed during the past nine months is 82 (45 new and 37 old), and the number of cases taken in hand is 128 (50 new and 78 old). This gives 210 cases (*excluding* those which for various reasons were found not to come within the Council's jurisdiction) dealt with in nine months, being at the rate of 280 a year, whereas during the ten years ending March 31, 1901, the average number of cases dealt with each year (*including* those which were found not to come within the Council's jurisdiction) was about 80, so that the rate of progress has been greatly accelerated. If the present rate be maintained, it will take about five years to dispose of the cases in which the Council has not yet formulated its requirements, without taking into account the additional notifications which are constantly being made. The number of such notifications has greatly increased since the Queen Victoria-street fire, the actual number last year having been 296, and although an increasing proportion turn out to be cases which have been previously notified, or cases with which the Council cannot deal, a great deal of work is involved, as in most cases a preliminary inspection is necessary, and in some cases several inspections have to be made.

In the discharge of its duty under the Factory Acts the Council has been confronted with two serious difficulties which have had the effect of making rapid progress impossible. These are, first, that in the case where any one part of a building is not a factory or workshop within the meaning of section 14 of the Act, it is held that a requirement for the provision of means of escape from the other parts of the building would not be reasonable, and could not therefore be enforced, if to comply with it the owner would have to commit a trespass on the part of the building which is not a factory or workshop. The effect of this has been in some cases to render it impossible for the Council to require the provision of satisfactory means of escape and to seriously impede progress, as in order to determine whether a requirement will involve a question of trespass it is frequently necessary to inquire into the terms of occupation of all the different persons carrying on business in the building under consideration. Secondly, delay is caused by the fact that any person who is dissatisfied with the Council's requirements may resort to arbitration at any stage of the proceedings, as he is not bound to declare his intention to do so within a reasonable time of receiving the requirements, but only within one month after a difference of opinion between him and the Council respecting such requirements has arisen. Since no period has been specified within which a person must declare a difference of opinion, it is often only after a considerable period has elapsed that the Council is informed that it is intended to resort to arbitration, and consequently much valuable time is lost.

The following particulars as to the approximate number of persons employed in factories, etc., notified to the Council may be of interest :—

Number of persons employed in—		
Factories, etc., in which means of escape have been provided to the satisfaction of the Council—		
Old factories	58,800	
New „	35,900	
		94,700
Factories, etc., being dealt with by the Council		70,000
Factories, etc., remaining to be dealt with ..		70,000
Factories, etc., notified to the Council, but with which the Council cannot deal		15,300
		250,000

The total number of persons employed in all factories and workshops in London was given in the Report of the chief inspector of Factories and Workshops for the year 1898 as 499,333, and it is therefore evident that the number of factories, etc., over which no control is exercised as regards the provision of means of escape in case of fire is very great. We regret that we are not in a position to obtain more recent data as to the total number of persons employed in factories and workshops, etc., in London, as the information is not included in the Annual Reports issued by the Chief Inspector of Factories since the year 1898. We think that this information is very valuable, and we should be glad to see it inserted in future reports.

Capt. Hemphill, in presenting the report, called attention to the details given therein on the work of the Council under the Factory and Workshop Act, 1901. The work of the Council in this direction had been much expedited during the past year. From 1891 up to March 1901 only 798 factories were dealt with, but since then up to December 31, 1903, inquiries were made in 2,282 cases. That was a very rapid and satisfactory increase. Formerly factories were dealt with at the rate of eighty per annum, but now they were dealing with them at the rate of 280 per annum. It was important to call the attention of the Council to the number of factories over which they had no control. In 812 cases the Council had been unable to interfere, owing to the fact that the number of employees was less than forty. Nor could they deal with factories occupied by different firms. Further delay was caused by the fact that those dissatisfied with the Council's decision could appeal to arbitration. It was interesting to note that, according to the report of the Chief Inspector of Factories and Workshops for the year 1898, 499,333 persons of the working-class were employed in London factories, and of course since that date the number had been largely increased. For the adequate protection of these people the legislative powers of the Council were quite insufficient. He wished to acknowledge the debt of gratitude which the Committee and the Council owed to Mr. Riley and his able staff, who had worked incessantly on one of the most remarkable works done by the present Council.

The report was then adopted.

By-laws under the Public Health (London) Act, 1891.—Suggestions made by the Public Health Committee in regard to by-laws under the Public Health (London) Act, 1891, will be found on another page.

Proposed Shakespearian Memorial.—The Historical Records and Buildings Committee reported the reception of a letter from Mr. Richard Badger, of Anglesea House, Eastbourne, suggesting that some fitting and permanent memorial to Shakespeare should be erected in London, where the poet's life work was done, and offering, subject to certain conditions, to pay 500*l.*, to be used solely in the promotion and carrying out of such a scheme as the Council might approve, and further to deposit with the Council upon trust the sum of 2,000*l.* as a subscription to the cost of the memorial itself. The Committee recommended that Mr. Badger be thanked for his generous offer, and that it be referred to the committee to report as to the best method of carrying out the scheme.

Mr. Dolman, the chairman of the committee, however, asked that he might take back the recommendation, in order that it might be brought up in another form.

This was agreed to.

Housing.—The Housing of the Working Classes Committee reported as follows :—

"We have to report that Coram-buildings, Herbrand-street site, Drury-lane, will shortly be ready for occupation. The dwellings, which have been appropriated for the purpose of re-housing persons of the working classes displaced in connection with the formation of the new street from Holborn to the Strand, provide accommodation for 200 persons in fifty two-room tenements.

Flooding of Basements.—A long report was submitted by the Main Drainage Committee, recommending the expenditure of 5,000*l.* for the preparation of plans, etc., preliminary to the commencement of flood relief works. The estimated cost of the works is 737,000*l.*, to which has to be added the cost of acquisition of sites for outlets and pumping stations.

Sir J. MacDougall said he welcomed the report, which referred to works which he had been in favour of for years.

Mr. Cousins contended that the Council had not kept pace with its responsibilities, and were to blame for not going more vigorously to work and constructing the intercepting sewers which were agreed to four years ago.

Mr. Burns, M.P., said the effect of the Council's work was indicated not only by new sewers, but was to be measured by the rapidly diminishing death-rate, which was due to the superior work of the County Council main drainage.

Mr. Beachcroft said there could be no doubt that delay had occurred in the provision of intercepting sewers. They would have been constructed had not the Council agreed to construct the Rotherhithe tunnel.

Mr. Idris pointed out that it was impossible for intercepting sewers to prevent local floodings.

After some further discussion, the report was adopted, and the Council soon after adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Kensington, South.†—Buildings to abut upon the west side of Cromwell-crescent and south side of Pembroke-road, Kensington (Mr. P. E. Pilditch for Messrs. J. Barker and Co., Ltd.).—Consent.

Strand.—Two projecting signs in front of Nos. 1 to 5, Poland-street, St. James, Westminster (Mr. S. Jones for the Lacre Motor Car Company).—Refused.

Strand.—Oriel windows and projecting shop fronts at Nos. 1 and 3, Old Compton-street, to abut also upon Charing Cross-road, Strand (Mr. C. H. Worley for Mr. T. Stevens).—Refused.

Width of Way.

Kensington, North.—The retention of a studio building at the rear of No. 16, Addison-road North, Kensington, with the boundary fence at less than the prescribed distance from the centre of the roadway of Princes-place (Mr. H. Cayley for Mrs. Clarke).—Consent.

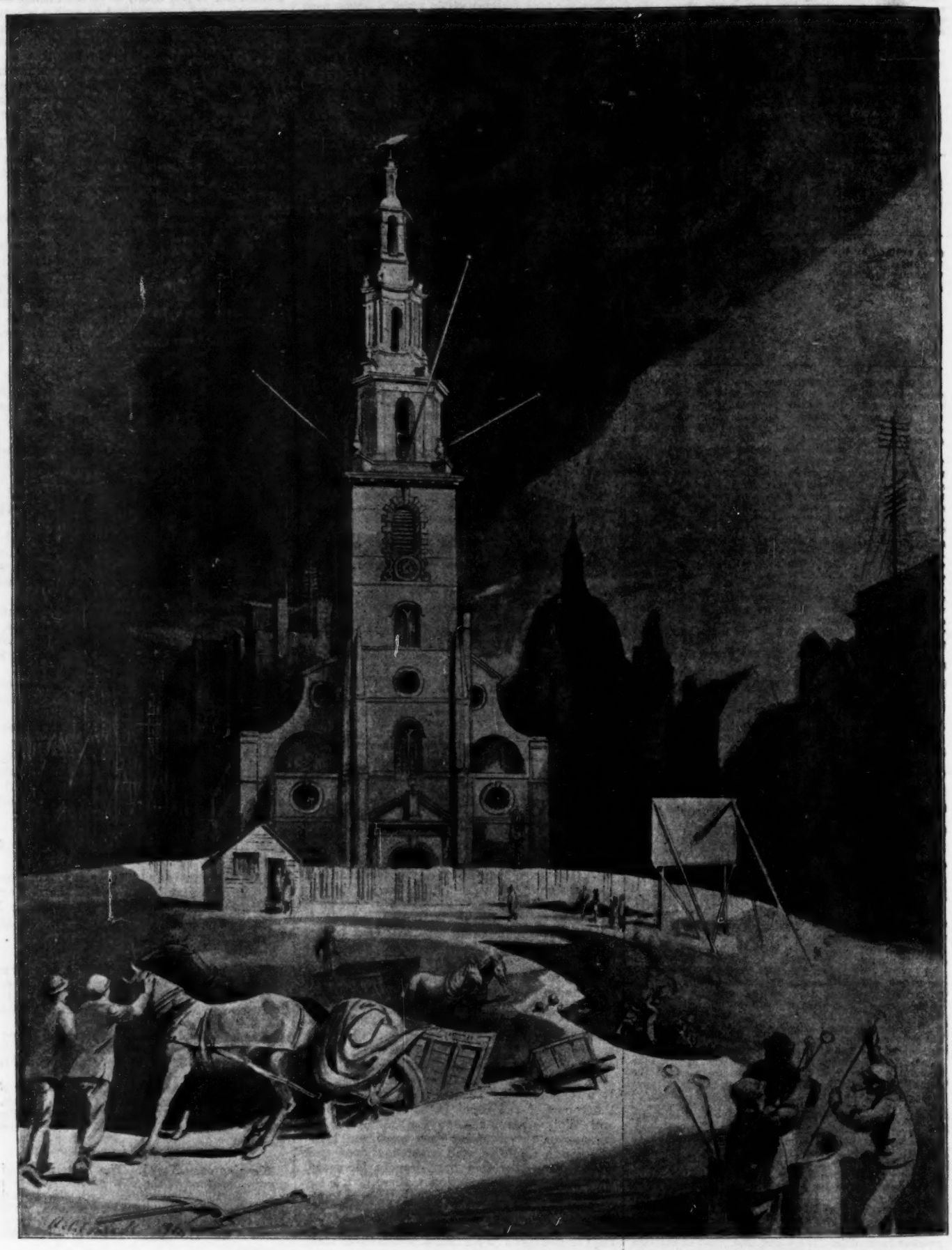
Rotherhithe.—A one-story building on the north side of Gibbons-rents, Bermondsey, with external walls at less than the prescribed distance from the centre of the roadway of the street (Messrs. F. Chambers and Son for Messrs. R. Dickeson and Co.).—Consent.

Width of Way, Lines of Frontage, and Projections.

Hammersmith.—One-story bay-windows and porches in front of Nos. 2 and 6, Paradise-row, Dalling-road, Hammersmith (Mr. W. J. Burns).—Refused.

Width of Way and Construction.

Wandsworth.—Deviation from plans approved for the erection of a one-story steel shed at Gothic wharf, Brewhouse-lane, Putney, so far



St. Clement Danes and St. Paul's: as seen from Newcastle-street during the present alterations. Drawn by Mr. A. C. Conrade.

as relates to the fixing of gable sheeting to such shed, and to the placing of lettering on such gables and on the side of the roof facing the river (Mr. A. E. Chasemore).—Consent.

Formation of Streets.

Paddington.—Retention of wooden fences or barriers across Lauderdale-road, Biddulph-road, Ashworth-road, and Delaware-road, on the Paddington estate, Sutherland-avenue, Paddington (Mr. H. A. Hunt).—Consent.

Wandsworth.—That an order be issued to Mr. H. Keen refusing to sanction the formation or laying out of new streets for carriage traffic to lead out of the south-west side of Totterdown-street, Tooting.—Refused.

Deviation from Certified Plans.

Strand.—Certain deviations from the plans certified by the District Surveyor, so far as relates to the proposed rebuilding of Nos. 7 and 8, Mason's-yard, Duke-street, St. James, Westminster (Mr. S. J. May for Messrs. Smith and Co.).—Refused.

Means of Escape at Top of High Buildings.

Holborn.—Deviation from the plan approved in respect of the means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, from the front rooms on the sixth floor of the Bedford Hotel, Nos. 83, 85, and 87, Southampton-row, Holborn, so far as relates to an alteration in the position of the doors and one step ladder (Mr. H. Walduck).—Consent.

The recommendations marked † are contrary to the expressed views of the local authority.

NEW VIEWS OF LONDON BUILDINGS.

The clearing away of sites for various operations of street improvement in London has the effect, from time to time, of opening out temporarily new and effective views of existing architectural monuments.

The accompanying sketch, made by Mr. A. C. Conrade, shows St. Clement Danes from a new

point of view, in consequence of the clearance made for the Holborn to Strand Improvement, and St. Paul's seen in combination with it as a distant object.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The Leeds and Yorkshire Architectural Society held a meeting on the 11th inst., when the subject of the registration of architects was discussed. Mr. W. Howard Seth-Smith gave an address in favour of registration, and he was opposed by Professor Beresford Pite. Mr. Seth-Smith, who opened the debate, contended that compulsory examination and its attendant education would raise the status of architects, and consequently the standard of architecture, and enable the public to distinguish between the qualified and unqualified practitioner. The theory that architecture was an art and therefore did not lend itself to examination he described as misleading, because neither in training nor in test could the art be divorced from the science. The art as such only existed in its application to utilitarian needs, and architects would ever be employed mainly for their practical qualifications. Herein was their only chance to express such artistic thoughts as might be inherent in them. Registration so far from disintegrating the profession, would unify it by the bonds of a common qualification and brotherhood.—Professor Pite said that architects to the public were artists, and as such could not come under an examination test. He doubted that registration and compulsory tests would raise the standard of education. Architects should be free and endeavour to cultivate high ideals and an independent standard of artistic aims and professional conduct. This would place architecture upon a much higher level than would compulsory examination. There were possible advantages in a universal examination in construction, but he thought that registration would be inimical to educational progress.—The subject was then thrown open to the meeting, and in the discussion that followed several gentlemen advocated a Registration Act, including Messrs. C. Bulmer, R. P. Oglesby, J. B. Howdill, H. E. Chapman, and A. Marshall (Otley). Mr. T. Monkman, of York, declared that his opinions in favour of registration had been strengthened by what he had heard. They could feel for the artistic standpoint from which Professor Pite spoke, but, on the other hand, they were compelled to look at the matter from the standpoint of the average architect, to whom registration appealed strongly, and the issue ought not to be decided by those who stood at the head of the profession. No matter how high his ideals may be, the architect had to descend to the level of business, and however he might try to cultivate and uplift art, he was bound to recognise that the commercial side of life entered very largely into his profession. He had to make his living, and consequently the question could not be decided without taking into consideration the views of the average architect. Registration would tend to improve both the architect's social status and ability. He would admit that it would be very difficult to institute an examination into a man's artistic qualities, but his scientific and constructive knowledge ought to be tested, and once they went so far it might be possible to do something with regard to the artistic side. They ought to debar a man from practising who had not to some extent a knowledge sufficient to entitle him to use the name of architect. In other professions men were not allowed to practise until they had shown some ability, and it seemed to him that the same argument should hold good of architecture. A compulsory examination would not prevent anyone from displaying artistic qualities and advancing as an architect in every sense of the word.—Mr. S. Kitson expressed the opinion that at present architects were not worthy of registration. They did not "hang together," nor were they educated up to registration, which, if adopted, would do harm.

MANCHESTER SOCIETY OF ARCHITECTS.—On the 11th inst. Professor Capper gave an address to the Manchester Society of Architects, in the course of which he spoke of the importance of the study of design in architecture. This, he said, was a first feature of the course of training at the Ecole des Beaux Arts in Paris, and also in all the schools of architecture in the United States. While we might look upon English architecture of the past with pride and the consciousness of splendid achievement, we could not now afford to dispense with adequate and thorough training in design, and this training should be especially the work of our university schools of architecture, such as that which had been formed at the Manchester University. To power in design all great buildings owed in chiefest measure their fame, and design should form from the earliest moment the backbone of the student's course of study. Professor Capper showed how academic training provided the best road to success, because it was the best means by which the student obtained that grasp of subject and breadth of view which were essential for the attainment of the best results. A proper academic course, he said, was not calculated either to stifle genius or to create a dead level of mediocrity, lacking the freshness of untrained spontaneity. Afterwards Professor Capper spoke appreciatively of the value of training on the practical side, but he pointed out that an office training was inevitably of a fragmentary character.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of the Sheffield Society of Architects and Surveyors was held on the 11th inst. in the Lecture Hall of the Literary and Philosophical Society, Leopold-street, Mr. T. Winder presiding. Mr. W. Gilbert (of the Bromsgrove Guild of Applied Art) gave a lecture on "Evolution of the Manufacturer in Art." The lecturer traced the origin of the guilds connected with craft from the earliest period, and referred to the beautiful work of the mediæval craftsman, when there was no division of labour, and when work was the pleasure of his existence from the time of his apprenticeship until he became full member of the craft. He also showed how great historical occurrences affected the guilds by developing art workshops and thus divorcing the artist and craftsman. The influence of Italian "commercial" artists during the Renaissance was next referred to at some length, and the various phases of craft work up to the XIXth century. The institution of classes for designing in this country was also mentioned. In 1851 there were twenty-two such classes in existence. The influence of the great exhibition in the year on craftsmanship was described by Mr. Gilbert. The conditions which alone would produce good work in art classes, he thought, were that they should not be municipal factories, competing in any way with local manufacturers, and that they should not be the home of fads, but the home of thought. The lecturer commended individualism in art. Craftsmen owed much to architects. He alluded to the fine work of the late J. D. Sedding, especially at the Holy Trinity, Chelsea, where his work was combined with the craftsmanship of Onslow Ford, Pomeroy, and others. The lecturer, in conclusion, pleaded for greater association between good workers in the production of good work, and especially between architects and the different craftsmen employed in building. A discussion followed, and on the motion of Mr. T. Swaffield Brown, seconded by Mr. Horace Wilson, and supported by Messrs. W. J. Hale, J. R. Wigfull, C. Green, E. M. Gibbs, W. C. Fenton, and W. F. Smith, a vote of thanks was accorded the lecturer.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the Edinburgh Architectural Association held on the 10th inst. in 117, George-street—Mr. J. A. Arnott, Chairman of the Associates' section, presiding—Mr. Charles Mackie, A.R.S.A., read a paper entitled "Common-sense in Art." He dealt with art origins, the composition of colour and line, and an attempt to arrive at a more scientific basis for colourisation, illustrating colour harmony from the tradition. All true taste in colour was, he said, founded on the practice of the masters; they were the originators, and so must be the final tribunal.

ULSTER SOCIETY OF ARCHITECTS.—A general meeting of the members of this Society was held in the rooms, 16, High-street, Belfast, on the 9th inst. The President (Mr. W. J. Gilliland) occupied the chair, and the following were elected:—Mr. James Gray Lindsay as member, Mr. George Kidney as associate, and Messrs. Jas. Reid Young, David Gorman, and Thomas Macivor as students. Mr. Seaver reported on the recent Local Government Board inquiry *re* the proposed Water Commissioners' by-laws, and the action of the council in opposing their confirmation was approved. A discussion took place on the subject of certain requirements of the City Surveyor with reference to information he desired in connexion with plans. It was decided that members should decline to supply this, as they believed it would interfere seriously with the necessary freedom of the architect in the construction of his buildings, and that it was not required by any section of Act of Parliament or by-law. Recent action by some members of the Belfast Builders' Association in endeavouring to substitute rules of the Association for the conditions of contract provided by architects in tendering was considered. It was agreed that tenders must be sent in by builders in conformity with the conditions of contract provided by the architect. It was reported that improved accommodation had been obtained for the Society at 13, Lombard-street. The action of certain employees of the Belfast Corporation in preparing plans and acting as architects was discussed, and referred to a committee to deal with. It was announced that the annual exhibition of the prize drawings of the Royal Institute of British Architects would be held, by permission of the Library and Technical Instruction Committee of the Council of the County Borough, in the Art Gallery, Public Library, during the week beginning April 4, and that an examination for students of the Society for the qualification of Associate of the Royal Institute of British Architects would be held in Belfast in the month of June next, due notice of the exact date to be given.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—The seventh ordinary meeting of the session was held on Wednesday, the 10th inst., Mr. W. J. Blain, President, in the chair, when a paper was read by Mr. James G. Morris on "The Planning of a Small House." The lecturer commenced by observing that a small house is primarily intended to be occupied by people who are usually very ordinary in their thoughts, and manner of life; and who, as a class, live mainly upon a more or less established system of prosaic conventionality. Within their walls will assuredly transpire those crises of all life—birth and death. Illness and nursing, with their often unexpected needs and extempore expedients, will be there, as well as the ordinary and everyday events of life, and social intercourse — modest entertainments, occasional festivities, and the rest and quiet of home life, which is the most important and enduring of all. He would like very much to impress upon his audience how imperative is the recognition of this broad human and personal element which is bound up with, and must permeate, all their work, if it was to be above the commonplace and of any real value. For, unless they had sincere sympathy, and the desire to understand and work with the spirit of life which animates the universe, and with their clients, as distinct and individual parts of this wide order of life and humanity, they would never attain to the best that was in them. Mr. Morris next commented at length on the disposition and arrangement of the various rooms and departments of the house to ensure economical and harmonious working; and urged architects, when planning, to endeavour to make their plan useful, interesting, even beautiful. Let them remember that human beings were to live in the houses which they built, and that they had aspirations higher than the merely animal need of shelter. Let them not stop at the mere practical and utilitarian achievement. Let their plan touch and maintain a higher note than was required for the stable or the byre. The intellectual man cried for much more from them than a safe and secure shelter alone. His sympathetic and imaginative faculties required understanding and response. The little community over which he presided had their needs, and rights, and privileges. Their intercommunion with one another must be considered and provided for, and to meet these and provide for them suitably and conveniently, one must have knowledge, not only of the general working of each department of the household, but also of the needs of those little contrivances for simplifying work and increasing comfort which meant so much, and which cost so little to obtain.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.—The thirty-seventh annual general meeting of the donors and subscribers will be held at the offices, 21, New Bridge-street, E.C., on Tuesday, the 23rd inst., at half-past seven p.m., to receive report and balance-sheet for the past, and to elect officers for the present year. The annual dinner will be held in the King's Hall, Holborn Restaurant, on Tuesday, April 19, Mr. F. G. Minter in the chair.

THE SANITARY INSTITUTE:

ROAD SANITATION.

A MEETING of the Sanitary Institute was held on Wednesday last week in Parkes Museum, Margaret-street, W., Lord Monkswell, Chairman of the London County Council, presiding. The evening was devoted to a discussion on "Road Sanitation," and addresses were delivered by Mr. J. Patten Barber, M.Inst.C.E., and Dr. Louis C. Parkes.

Mr. Barber, in the course of his remarks, said that hitherto it had been scarcely necessary in country districts to take into account sanitary conditions in road-making and maintenance, for a well-made macadamised road gave a sound and lasting surface, but the increasing use of motor vehicles would necessitate, no doubt, the construction of dustless roads or the adoption of means for laying dust raised by vehicles on ordinary macadam roads. The first alternative could be provided by tar macadam which, though more costly, was freer from dust and mud; and the second by treating the road with oil or tarry matter. But in regard to town roads, sanitary requirements were very important, and this was especially the case with ordinary macadam roads, heavy traffic on which produced a great deal of dust and mud. Some few years ago he had under his charge a macadam road in Islington, along which some 500 omnibuses passed each day. Everything was done to keep the road clean and prevent offensive smells coming from it; orderlies were employed, the road was washed three times each week, and deodorising liquid was used daily during the summer; but notwithstanding this the smell was often intolerable. He mentioned this to show that, whatever care was taken, it was impossible to keep the macadamised road, exposed to heavy traffic, free from offensive smells, and such construction was unsuitable for town roads. Macadam roads would be found to be the most costly form of construction—excluding such material as flint. The cost of keeping such a road in the same state of repair as a paved road was excessive, and a macadam road, which it was necessary to coat as frequently as once or twice in two or three years, should be converted into a paved road. There were many miles of these roads in London from which large quantities of mud and dust were carried to the paved roads forming the main lines of vehicular traffic, so that if the necessary paving were done it would benefit those residing in or passing over these roads. The important work of reducing the dust in the atmosphere would be greatly assisted. The road which would find favour as the most sanitary road might be described as one formed of smooth, hard, non-absorbent material, incapable of being indented by traffic, softened by atmospheric temperature, or disintegrated by weather to any appreciable extent, which could be laid in a homogeneous mass without joints and so laid as to easily carry off water to the gullies. There was only one material, *i.e.*, asphalte, which approached this standard, but even asphalte had disadvantages, for, as only the compressed asphalte is suitable for vehicular traffic, it could not be laid in that shape which the ideal road should have, and the finished surface had many small depressions. But the facility with which the asphalte road could be cleaned, the small amount of dust it gave rise to, the freedom from joints, and its non-absorbent qualities, served to place asphalte first for sanitary road purposes. Sanitary considerations alone were under consideration, and the point was not whether this material was suitable for horses, shod as they are now. Woodpaving had the disadvantage of many joints and it was absorbent, but the first objection could be got over by the use of bituminous grout for filling the joints, and the second by creosoting the blocks, or by the use of hard wood. Hard wood, however, shrunk considerably in dry weather, the blocks becoming loose and the joints enlarged, but he had not seen such changes in creosoted deal. A very accurately-shaped road could be formed of wood-blocks, making it easy to clean; but after a few years the blocks wore away unequally, and it was then not so easy to keep clean as in the case of the asphalte road. Granite setts, if the joints were filled with bituminous grout, made a practically non-absorbent road, but noisy and not so easily cleansed as the other paving materials mentioned. Authorities in large towns were prevented from using the most sanitary road material by the consideration which will provide the best foothold for horses, and it was a question whether a mode of shoeing could not be devised which would relieve the authorities from thus having to substitute the necessities of the horse for the health and convenience of the people.

Mr. Barber then dealt with cleansing roads. The most suitable material having been laid, the road was at once a receptacle for dirt and filth from various sources. The time was not near when horse traction would be superseded by motors; if it were so, the chief source of road pollution would soon be stopped. So, while regretting the conditions as they are, and while trying to improve them, it was necessary to take things as they are, and use the best available means for properly clearing away everything in the shape of dust, refuse, and filth from the streets. A well organised system of orderlies for removing filth and refuse in the day and a plentiful washing with water (unless sufficiently washed by rain) were necessary for thoroughly cleansing public thoroughfaces. The freeing of a road from semi-liquid mud or slop was a simple operation, but the removal during the day time, from a road crowded with traffic, of the thin film of greasy material which caused horses to slip was a most difficult task. Owing to the extreme thinness of the material to be removed it was unaffected by any tool that could be applied to it, whilst any attempt to wash it away by first watering the road and converting the greasy substance into slop, might unduly interfere with the traffic, and would certainly be much complained of by pedestrians. The borough engineer had but one remedy available for a road in the condition referred to, viz., to make a temporary surface by a plentiful sprinkling of sand or fine shingle, and to thoroughly wash the road at night. The removal from the roads of the mud and slop, which were produced in unlimited quantities in wet weather, was never carried out in a manner which satisfied the public. The work could be done in a reasonably efficient manner, and well enough to satisfy any reasonable critic, if a sufficiently numerous staff and the necessary amount of supervision were provided; this, however, could not be done without considerable expense.

Dr. Parkes first dealt with the health aspects of the question. It might be said at once that there was very little direct evidence that any injury to health was caused by the insanitary condition of London streets, chiefly because, out of the multiplicity of conditions favouring or exciting loss of health or actual disease amongst our population, it was most difficult, if not impossible, to select a certain agent where so many participate, and to say definitely this was the exciting cause. On the other hand, with the continual advances made in pathology and in bacteriology, we were enabled, as time advances, with more and more certainty to select *à priori* certain conditions as being those which from analogy we should consider to be capable of influencing the public health, and, although no complete proof was capable of demonstration, we were satisfied to regard these conditions as operative factors. Bearing in mind then the above limitations, we might say at once that there appeared to be two things intimately associated with our London streets that we might reasonably regard *à priori* as influencing adversely the public health. They were dust and mud—different names for essentially the same thing, for whilst dust was dried and powdered mud, mud was merely wetted dust. Now, as we all knew, the mud and dust of London streets, especially in the great highways of traffic, was filth; it was largely composed of putrefying organic matter from horse-droppings, with its teeming swarms of putrefactive bacteria. Which was the most dangerous to health, mud or dust? To this we could safely answer, dust. Why? Well, dust attacked our mucous membranes, *i.e.*, the delicate lining membranes of the orifices and passages leading to our internal organs. Mud did not; that was to say, unless the passer by happened to have a lump of mud splashed into his eye or mouth. Then again, the dry dust of the street not only got into our nostrils, throats, and possibly into our lungs, but it found its way into our houses, and, unless we were careful, settled on our food, and by its contained bacteria set up fermentative changes therein, which rendered it at times unwholesome, at other times positively dangerous. The irritating decomposing dust of the London main thoroughfares had been credited with causing sore throats, nasal catarrh, conjunctivitis, pneumonia, and numerous other diseases of the respiratory organs and passages; and it seemed at least highly probable that this organic dust, which was so much in evidence in the London streets in such months as March, when the wind was dry and boisterous, and which tainted the whole atmosphere in the warmer months of the year when rainfall was deficient, was a contributory if not the exciting cause of these and other diseases. The past year, 1903, supplied an experimental demonstration of the way in which relative absence of dust might conduce to a healthy season and a low death-rate. Last year was one of the healthiest years on record in London, and it was one of the wettest. In 1903, then, nature very materially supplemented the usual cleansing operations of the London municipalities, with the result that during the wet periods the roads presented a wonderfully clean appearance, and the private drains and public sewers received such a flushing as they had seldom received before. All this was most beneficial for the inhabitants of London, except perhaps for the unfortunate people whose basements were flooded by the storm waters which the sewers were inadequate to convey away. The lesson of 1903 would appear, then, to be that greater attention should be given to the flushing of our main thoroughfares with water, especially in the warm and dry months of the year. This was especially important in the case of asphalte and wood-paved roadways. On such surfaces the dirt consisted of little but horse-droppings, which very quickly desiccated and formed a strong and pungent dust, easily raised by the wind. All wood and asphalte streets which were main lines of traffic should be flushed with hose and jet, and subsequently swept, every morning from March to October, unless there had been heavy rain in the night. It was very commonly the practice to sweep the streets when dry, but this was a practice not to be commended, as the operation raised clouds of dust, which settled again, often out of reach of the broom, and the result was not satisfactory. In very busy thoroughfares, where there was much omnibus traffic, some disinfectant solution should be mixed with the water in the watering carts, not necessarily to disinfect, but to deodorise the dirty wood roadways, and to at least attenuate the odours about which so much complaint was made. Possibly a chlorinated solution, containing a small amount of available chlorine, would be the best for this purpose. Extra flushing and cleansing of the streets meant extra cost. There was no available supply of cheap, unfiltered water in London, and nothing had yet been done to draw a supply of water for flushing purposes direct from the Thames in London. The rates were already very high. Was it possible to go to greater expense in this matter? He found that in 1902 in Chelsea the cost of cleansing and scavenging the streets, including watering, was about 14,000*l*. The maintenance and repairs of the public roads, streets, and paths cost another 14,000*l*. Assuming that the whole metropolis spent a proportional amount in accordance with its population—an assumption which probably erred on the side of being under the mark, as Chelsea was a little off the main traffic routes—then the annual cost of scavenging and cleansing and watering the London streets was about 850,000*l*., and a similar sum was spent annually in maintenance and repair. If motor traffic could be made to supersede horse traction in London, it seemed probable that the cost of scavenging, cleansing, and watering could be reduced by half, and the cost of maintenance and repairs by a similar amount—a total saving of 850,000*l*. per annum. It was the horse that produced the dust, dirt, and mud that had to be laboriously collected by hand labour and carted to the outskirts, or barged away down the Thames. It was the horses' iron-shod feet that tore up the roadways and rendered necessary the enormous annual expenditure in maintenance and repair of the streets, and their periodical repairing at short intervals. If there were no horses the slop-water from asphalte and wood-paved streets could be swept straight into the gullies and so to the sewers, and the wear and tear of the street surfaces would be enormously reduced. Motor traffic, then, was a thing that the intelligent Londoner should encourage by every means in his power. It was the only real and lasting solution of the "insanitary street" problem. Enormous additional sums under existing circumstances might be spent in scavenging, cleansing, and watering, but the total result would not be very appreciable in a dry and hot season. We could not expect natural causes to aid

us every year, as the weather did in 1903, nor was it otherwise a consummation to be wished for. Probably the best means of accelerating the transition from horse traction to motor traction would be—(1) the widening of the main lines of traffic, so that vehicles could proceed at a uniformly greater speed than at present. (2) Inasmuch as it was especially desirable that heavy two-horsed vehicles, such as omnibuses and drays, should be replaced by motor-driven vehicles, as it was essentially the heavy horses and heavy loads that, continually stopping and restarting, tend to break up the surface of the streets, it would seem desirable that omnibus companies and companies or firms carrying heavy goods should be encouraged to inaugurate motor traction by a system of municipal subsidies. If over a million and a half sterling was spent annually in London by the ratepayers in scavenging, cleansing, and repairs of the streets, necessitated chiefly by the employment of horses for all classes of traffic, 100,000*l.* annually might be devoted to a system of subsidies, by the aid of which a portion at least of the heavy horse traffic might be got rid of from the streets, and the cost of cleansing, scavenging, and repairs materially reduced. A beginning once made in this direction, the advantages of motor traction would soon be generally recognised, and in the course of a few years we might expect to see at least as many motor vehicles as horse vehicles in the streets. In his opinion, dogs in London were an unmitigated nuisance. The disgusting condition of the pavements and sidewalks in many parts of London was due to dogs' excreta. It certainly seemed desirable that our borough surveyors should seriously consider as to the best means of cleansing the footways, and so performing a duty which the State had cast upon them. To sum up, then, his conclusions, in one sentence:—"All animals in big towns, except of course man himself, are a nuisance. Let us do our best to get rid of them."

Mr. W. Whitaker, Chairman of Council of the Institute, proposed a vote of thanks to Mr. Barber and Dr. Parkes for their remarks on a most interesting subject. As to motor-cars, he thought that the dust nuisance they created was likely to do good in the direction of making the authorities do more road-watering than they do now. It would pay the authorities to do more road-watering, for watering prevented the rapid destruction of roads. Everyone thought that the year 1903 was a bad year on account of the rain, but he preferred rain to dust, and he hoped that the great natural object-lesson of last year, *i.e.*, the great gain to public health, resulting from laying the dust, would not be forgotten by the local authorities. It was in the power of many of our large corporations to modify the evil effects of dust by turning it into a state in which it could easily be removed from the streets.

Dr. Shirley Murphy said there was no doubt that what was wanted in every town was that the surface of the roads should be impervious, and that they should be washed or cleansed. He was told by London surveyors that the reason why we could not have this was the cost, but what would be worth working out was how much saving there would be in the cleansing of streets if large areas were paved with impervious material and washed, as against the scraping-up, etc., of mud from the cheaper macadam road. Probably the greater cost would be on the side of the impervious road, but the difference would not be so great. Of course, it would be necessary that the area to be paved with impervious material should be sufficiently large, otherwise mud from neighbouring macadam roads would be brought in by vehicles and the saving which ought to be effected would not be obtainable. It was greatly to be wished that there should be some general agreement between the different districts of London as to how a main and important road should be dealt with. He had discussed that with borough surveyors who had told him that it was impossible to have anything like uniformity over a very large area in London. The result was that, in the case of a road passing through two districts, the traffic being exactly the same, different road material was often used. That ought not to be so, and there ought to be experience to determine how all main and secondary streets and courts and alleys should be dealt with. The necessity for dealing with the poor streets, especially market streets, with impervious material, was obvious.

Mr. J. Paget Waddington, Borough Surveyor of Marylebone, said that the main question was one of money. The difficulty was to get the authorities to allow sufficient money to do the work properly. As to the construction of roads in suburban districts, and the suggestion made by Mr. Barber for forming carriage-ways of tar macadam, he (the speaker) had had some experience of this class of road in the north of England. He had constructed about three and a half miles of this form of carriage-way on a main road between two large towns, and, having regard to the cost, it wore remarkably well and was much more sanitary than an ordinary limestone macadam road, and there was much less dust and mud created. The material of the district was limestone, and that, coated with tar, was used for the work. The question of pavements for roads in London was a large one, and one upon which diverse opinions were formed. He should be sorry to see the whole of the carriage-ways of London turned into asphalte carriage-ways, though he quite admitted that up to the present time asphalte was by far the most sanitary and the most easily cleansed; but it was difficult for horses and dangerous to riders and drivers. But any paved roadway was dangerous under certain conditions. The carriage-way of Oxford-street at the entrance to Marble Arch was of Australian hardwood, and the number of complaints he had received from equestrians who went into the Park at Marble Arch was very numerous; when the time came for repaving the road he did not think the Borough Council would again use that material. Deal was a much safer material where horses were concerned. Yellow deal was a luxurious paving, but in his opinion it was worth the cost. Harley-street was paved some three or four years ago with yellow deal treated with carbolineum, and it was the only street of any consequence in the borough which had been so treated. The blocks were immersed in the liquid for about five minutes and then allowed to drip before being laid. During dry weather there was less dust on the carriage-way of Harley-street than on other streets adjoining paved with plain or creosoted deal, and after rain the Harley-street road dried more quickly than the others. That was the experience in an adjoining district, he believed. He thought that the blocks ought to be immersed for a longer period, but there was much to be said for this material. A short length of Albany-street, adjoining Marylebone-road, was paved seven or eight years ago with deal treated with carbolineum, but the blocks were then immersed for over thirty minutes, and the result was about the best piece of deal paving he knew of in London. During the five years that that road was under his control he could not recollect having had to repair it. He did not agree with the suggestion as to the abolition of horses and dogs: he was a lover of animals, and he hoped the day was far distant when we should see no horses or dogs in our streets; he would sooner retain the horses and dogs and pay a little more in rates to keep the streets clean. As to washing roads with water from a hose-pipe, that was done in some districts, but he had come to the conclusion that washing soft wood-paved roads—and, indeed, hard wood roads—with a hose-pipe was very injurious to the roads. The water was forced into the interstices of the blocks, the grouting material being washed out, and the blocks were set floating, with consequent damage to the foundations. He preferred the old-fashioned way of water-cart washing. All the wood-paved streets of Marylebone were washed every night by means of water-carts and squeegees. Machine brooms he used for one or two years, but he found that the work could be done more efficiently and economically by hand labour.

Mr. C. H. W. Biggs said it was a disgrace that it was necessary to have that discussion on such a subject. Each speaker said that we could have sanitary streets if someone would only pay the cost, and yet things went on just the same! The money for such work must come from the people, but it would not be forthcoming until the people were made to believe that sanitary streets would pay them. Would such streets pay them? The money value of health was far greater than the cost of keeping streets sanitary, and the way to get the money was to teach people to see this. Satisfactory macadam streets could not be made where there was heavy traffic, and that tar macadam was a better material they all knew; but it was not generally used, and when it was used it was not used to the best advantage. At such places as Cromer and Yarmouth, however, where there was a fairly heavy traffic, tar macadam was used, and it wore well and was sanitary. As to slippery wood roads, if the user of horses would put on a horse the worst possible form of shoe, then the owner was not doing his duty; the maker of the street did all he could with the money at his disposal. People did not have their horses properly shod.

Mr. T. Langster said that London streets should be asphalted as motor-cars were sure to increase and asphalte did not cut tyres as did stones and sharp grit.

Lord Monkswell, in putting the vote of thanks to the meeting, said he was in general agreement with what had been said that evening, that in all probability an increase in expenditure on cleansing roads was desirable, but he might observe that that was not the only matter on which increased expenditure was desirable.

The vote of thanks having been agreed to,

Mr. Barber, in reply, said they were preaching this sermon as to the sanitation of roads year after year with little effect. The matter was one of time; people required educating, and he thought they were becoming educated on the subject. If they gave the subject a minute's consideration, they must see that if a thing was to be done three times a week instead of once then the cost must be increased. We needed men who were absolutely fearless in the expenditure of money in the proper objects, and who were not afraid of the narrow-minded individuals who threatened with all sorts of pains and penalties the next time a vote had to be given. There was too great a cry as to reduced rates and expenditure made by those who knew they could not reduce rates or expenditure; expenditure on all matters as to public health and convenience in London must increase of necessity.

Dr. Parkes also replied, and referred to the work of the London County Council in providing electric traction in London—a work which would make an enormous difference in London in the course of a few years, which would free the streets of many horses, would provide rapid transit, and help to solve the housing of the working classes. He thought there must be more and more municipal expenditure as the years went on, though there might be a little more efficiency in the work which was done now. There was still an idea that any class of men was good enough for sweeping and cleaning streets, but it paid better to have young and intelligent men to do even work of that sort. Cheap labour was dear in almost all things.

On the motion of Mr. Norman Scorgie, seconded by Mr. Whitaker, a vote of thanks was accorded to Lord Monkswell for presiding.

Lord Monkswell replied and the meeting terminated.

The next meeting will be held on Saturday, March 26, when a discussion on "Municipal Housing" will be opened by Mr. W. E. Riley, Superintending Architect of the London County Council, and in the afternoon a visit will be made to certain buildings in the Metropolis.

BY-LAWS UNDER THE PUBLIC HEALTH (LONDON) ACT, 1891.

The Public Health Committee of the London County Council reported as follows at Tuesday's meeting of the Council, the recommendation being agreed to:—

Our attention has been called to a decision given on December 9 by the High Court (King's Bench Division) in the case of Nokes and Nokes *v.* the Mayor, Aldermen, and Councillors of the Metropolitan Borough of Islington, to the effect that by-law No. 26 made by the Council under section 39 of the Public Health (London) Act, 1891, in relation to the number of water-closets in proportion to the number of inmates in lodging-houses is invalid, as it does not provide for notice to be given before action is taken.

The by-law in question provides, *inter alia*, as follows:—"The landlord, or owner of any lodging-house, shall provide and maintain in connexion with such house water-closet, earth-closet, or privy accommodation in the proportion of not less than one water-closet, earth-closet, or privy, for every twelve persons."

Having regard to the importance of the matter, we at once instructed the solicitor to report as to the amendment in the by-law which was necessary in order to remove therefrom the defect which rendered it invalid, and he has now advised that a proviso should be added to the by-law to the effect that notice shall be given by the sanitary authority, and that a penalty shall only be recoverable if the person on whom the notice is served shall have failed to comply therewith.

There are certain other paragraphs in this by-law requiring the occupiers of premises to cause a periodical cleaning of water-closets, earth-closets, privies, cesspools, and receptacles for dung. Having regard to the provisions of section 30 of the Public Health (London) Act, 1891, it is necessary that these paragraphs of the by-law should be amended by omitting all reference to earth-closets, privies, and cesspools therefrom.

We append to this report (Appendix I.) a copy of the

by-law in its present form, and in the form in which we are advised it should be amended.

We are at present considering generally the question of the amendment of the by-laws made under sections 16 and 30 of the Act above referred to, but we think that it is desirable for the Council to at once repeal by-law No. 26 and to substitute the amended by-law therefor; otherwise serious difficulty may be experienced by sanitary authorities in securing the provision of adequate water-closet accommodation in houses let in lodgings. Section 114 of the Act provides that in making any by-laws which will have to be observed and enforced by any sanitary authority, the Council shall consider any representations made to it by that authority, and at not less than two months before applying to the Local Government Board for the confirmation of any such by-laws, shall send a copy of the proposed by-laws to every such authority. We accordingly propose that copies of the amended by-law shall be sent to the sanitary authorities for their observations; and we therefore recommend that copies of the proposed amended by-law set out in Appendix I. to this report be sent to the London sanitary authorities for their observations, pursuant to the provisions of section 114 of the Public Health (London) Act, 1891.

The following is the Appendix, omitting the existing by-law:—

Proposed Amended By-law.

26. The occupier of any premises shall cause every water-closet belonging to such premises to be thoroughly cleansed from time to time as often as may be necessary for the purpose of keeping such water-closet in a cleanly condition.

The occupier of any premises shall once at least in every week cause every receptacle for dung belonging to such premises to be emptied and thoroughly cleansed.

Provided that where two or more lodgers in a lodging-house are entitled to the use in common of any water-closet or receptacle for dung, the landlord shall cause such water-closet or receptacle for dung to be emptied and cleansed as aforesaid.

The landlord or owner of any lodging-house shall provide and maintain, in connexion with such house, water-closet, earth-closet, or privy accommodation in the proportion of not less than one water-closet, earth-closet, or privy, for every twelve persons.

Provided that the landlord or owner of any lodging-house shall not be deemed to have offended against the last mentioned requirement of this by-law until the sanitary authority shall have caused notice to be served on such landlord or owner requiring him forthwith or within such reasonable time as may be specified in the notice to provide and maintain in connexion with such house, water-closet, earth-closet or privy accommodation in the proportion as aforesaid, and he shall have failed to comply with the notice.

For the purposes of this by-law, "a lodging-house" means a house or part of a house which is let in lodgings or occupied by members of more than one family. "Landlord" in relation to a house or part of a house which is let in lodgings, or occupied by members of more than one family, means the person (whatever may be the nature or extent of his interest) by whom or on whose behalf such house or part of a house is let in lodgings or for occupation by members of more than one family, or who for the time being receives or is entitled to receive the profits arising from such letting. "Lodger" in relation to a house or part of a house which is let in lodgings or occupied by members of more than one family, means a person to whom any room or rooms in such house or part of a house may have been let as a lodging for or his use or occupation.

Nothing in this by-law shall extend to any common lodging-house.

Illustrations.

RESTAURANT, GREAT PORTLAND-STREET.

THIS elevation shows the extension and alteration of Messrs. Pagani's building, which has been recently effected. Before these works the elevation consisted of two ordinary house fronts, with a small arcade of four arches on the ground floor, from the designs of Mr. C. Worley.

The adjoining house was added, the upper part of which was maintained, and the mezzanine arcade of three arches and one complete bay to the ground floor was added.

The whole of the upper fronts were covered with a glass mosaic and connected with a coved cornice.

These works were executed by Messrs. Hayward and Son, of Regent-street; the terra-cotta by the Leeds Fireclay Company; and the mosaic by George Bridge, of Oxford-street. BERESFORD PITE.

DESIGN FOR CAPE UNIVERSITY BUILDINGS.

THIS design, by Mr. W. F. Harber, did not gain any honours in the competition for new buildings for the Cape University, but we think it quite worth illustration as a design which shows both original character and a satisfactory unity of conception.

The plan explains itself. The exterior was intended to be built of granite, banded in two colours; the dome vaultings, flats, floors, and galleries would be of ferro-concrete. The dome above the granite steppings to be covered with granite chipping thrown on the cement. The hall and corridors were to be paved with mosaic, with hardwood blocks for the University Hall and other rooms.

Architectural effect has been sought for by mass rather than detail, which latter has been purposely avoided, except as regards the introduction of sculpture.

HOUSE AT MEDMENHAM.

THE drawing reproduced was the original design for a house at Medmenham, to be carried out in red brick, Portland stone, and tiles. The stables are shown to the right of the drawing.

The design was considerably altered in execution.

Mr. Blomfield sent us a plan, but too late to have it reproduced in this issue; we will give it in our next.

MANSFIELD HOUSE UNIVERSITY SETTLEMENT, BARKING-ROAD, E.

THIS building was erected in 1896 for the residence and necessary offices of the Mansfield House University Settlement, which had already been at work in the district since 1890. The hall, workmen's clubrooms, boys' club, and other centres of work are housed in different buildings close by, most of them also in the Barking-road. The building illustrated is, therefore, strictly residential, except for the suite of offices on the ground floor, to which the central door leads.

The structure is carried on a raft of concrete 3 ft. thick, covering the whole area, and stiffened with embedded steel joists where concentrated loads had to be distributed.

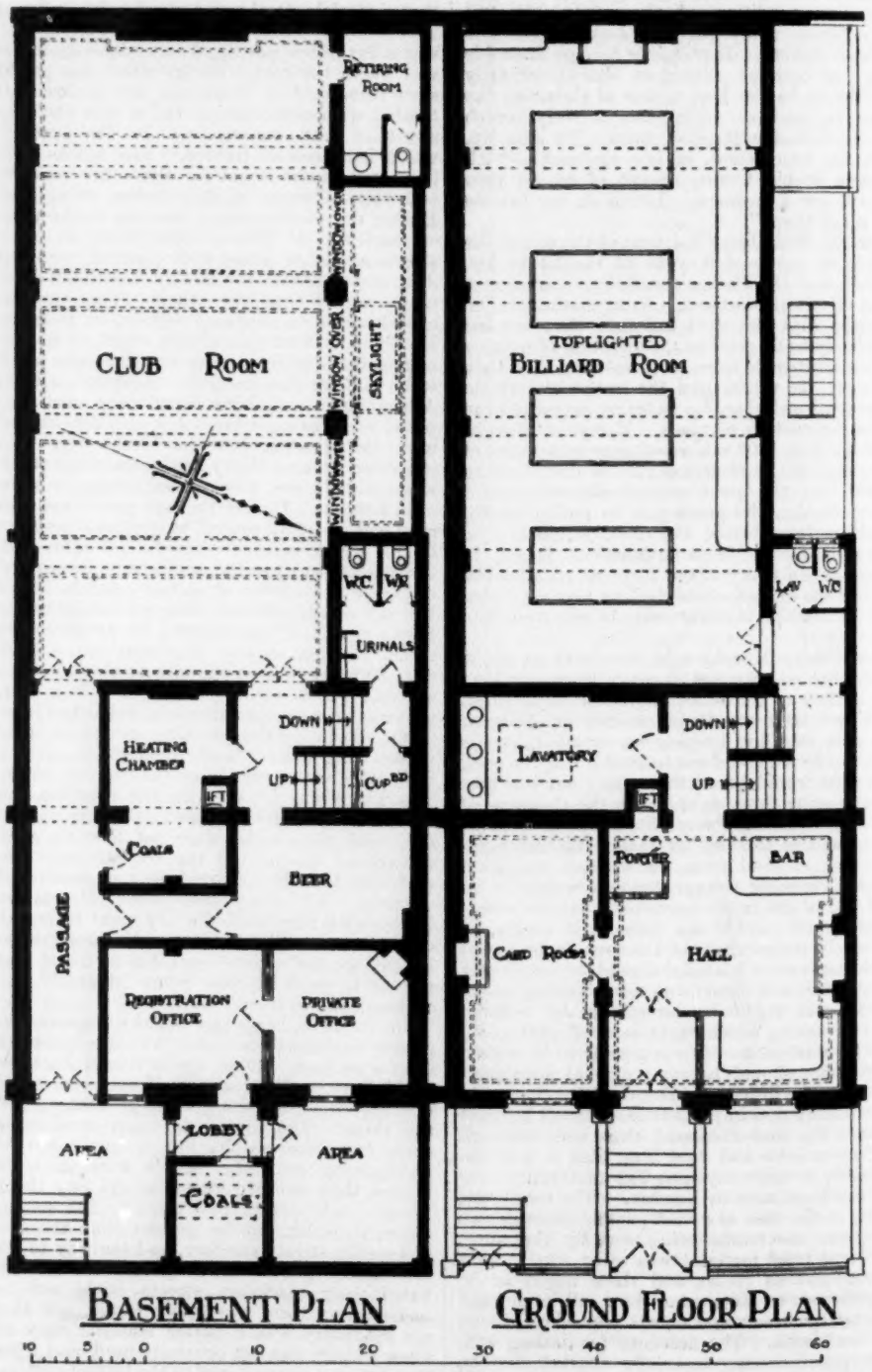
The lower portions of the front wall are of granite and salt-glazed bricks, the remainder of red brick, with Portland stone balcony, copings, etc. The Mansard roof is covered with lead and Westmorland grey slates. On the nearer portion of the roof a good-sized conservatory has been built, the main stair going up to the roof and giving access to it.

The two large rooms shown on the first floor plan are used for social gatherings of various kinds. The warden's suite of rooms are in the back wing of this floor. The two floors above consist mainly of single rooms, one or two, however, being double sets, for the residents and visiting workers.

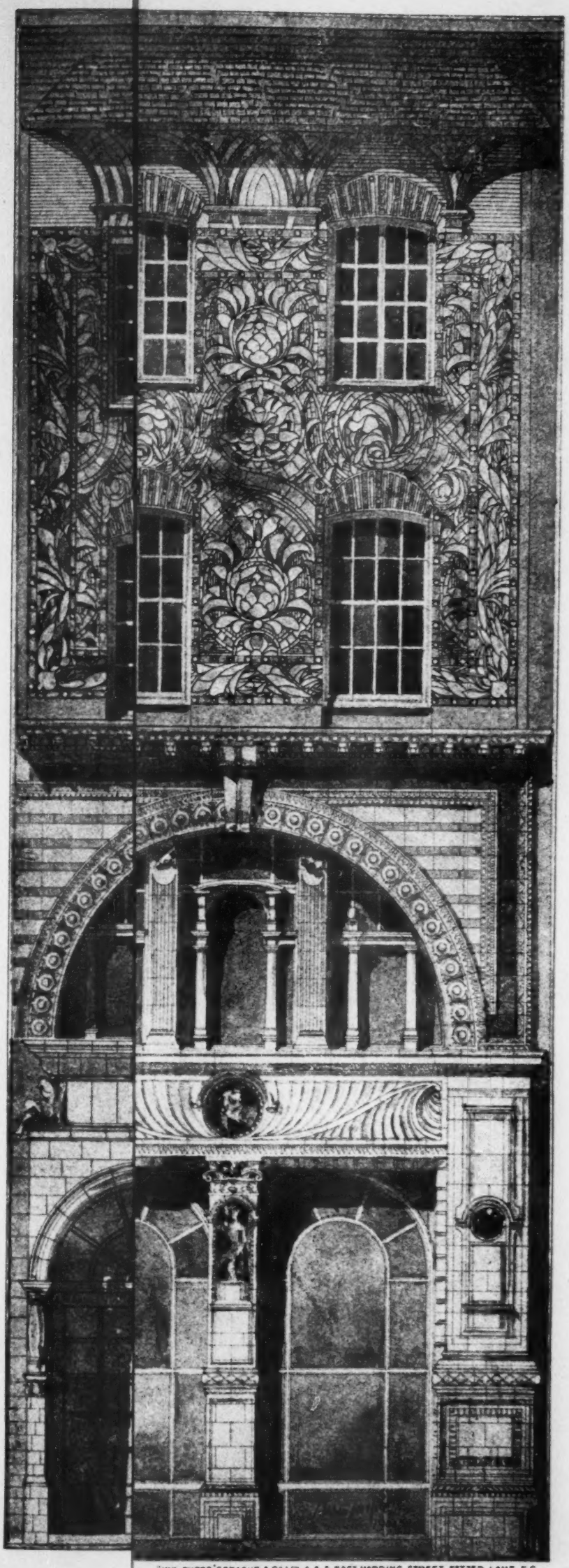
The builders who carried out the work were Messrs. Gregar and Son, of Stratford, E., and the total cost was between six and seven thousand pounds. F. W. TROUP.

PAVILION FOR THE CONSOLIDATED CLUBS, MAGDALEN COLLEGE, OXFORD.

THIS pavilion was built, during last year, on the new ground between the Cherwell and the Marston road. It contains on the ground



Constitutional Club, Shoreditch. Plans.



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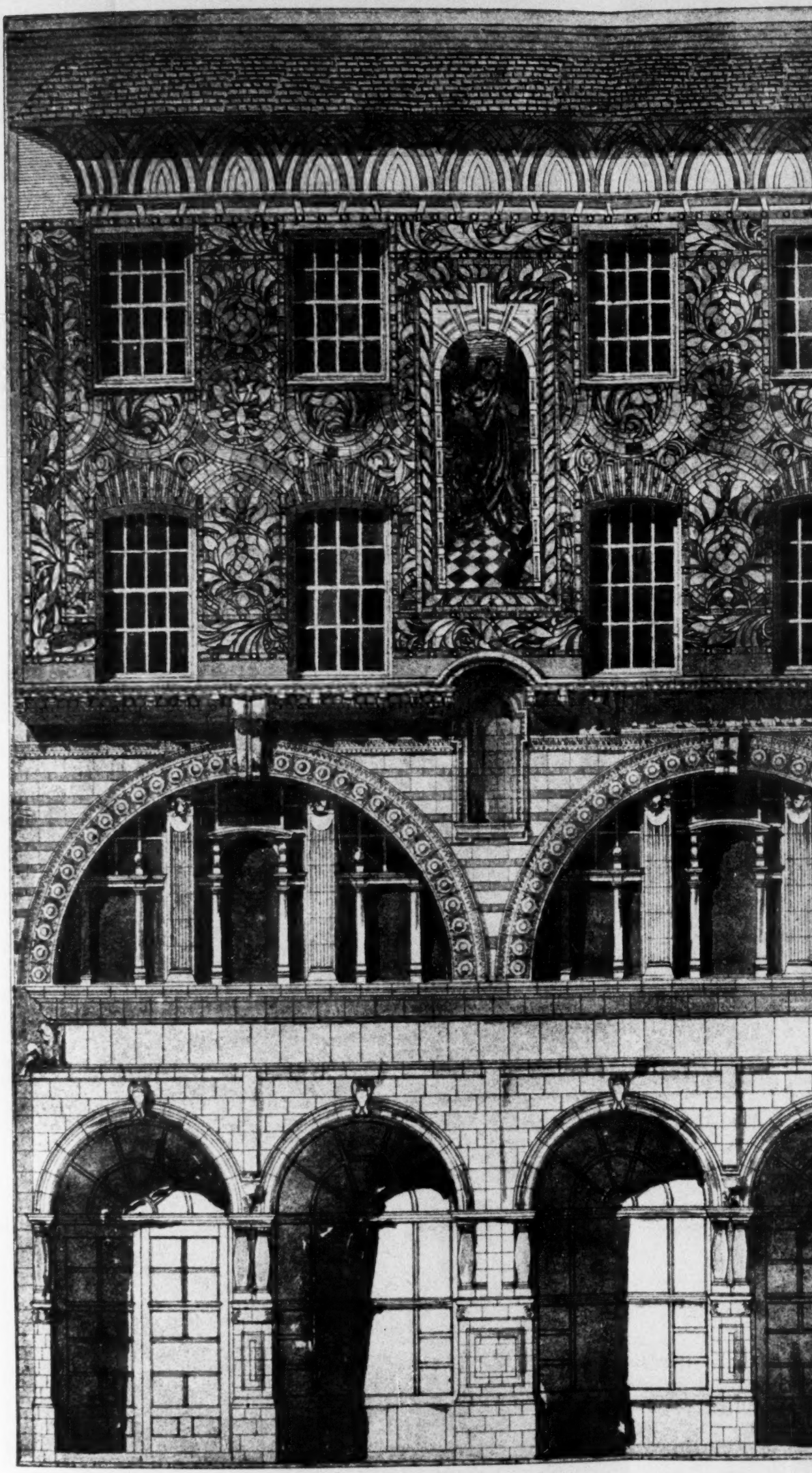

RESTAURANT, GREAT PORTLAND STREET, LONDON.—

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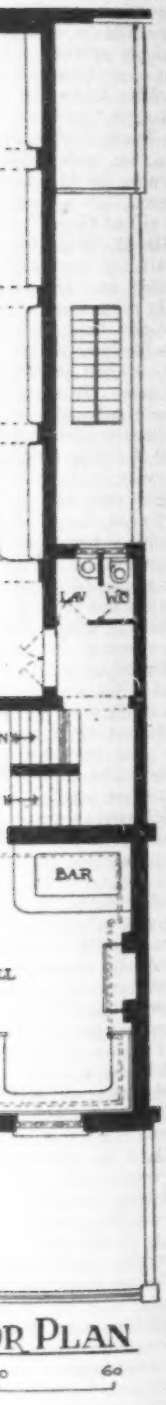

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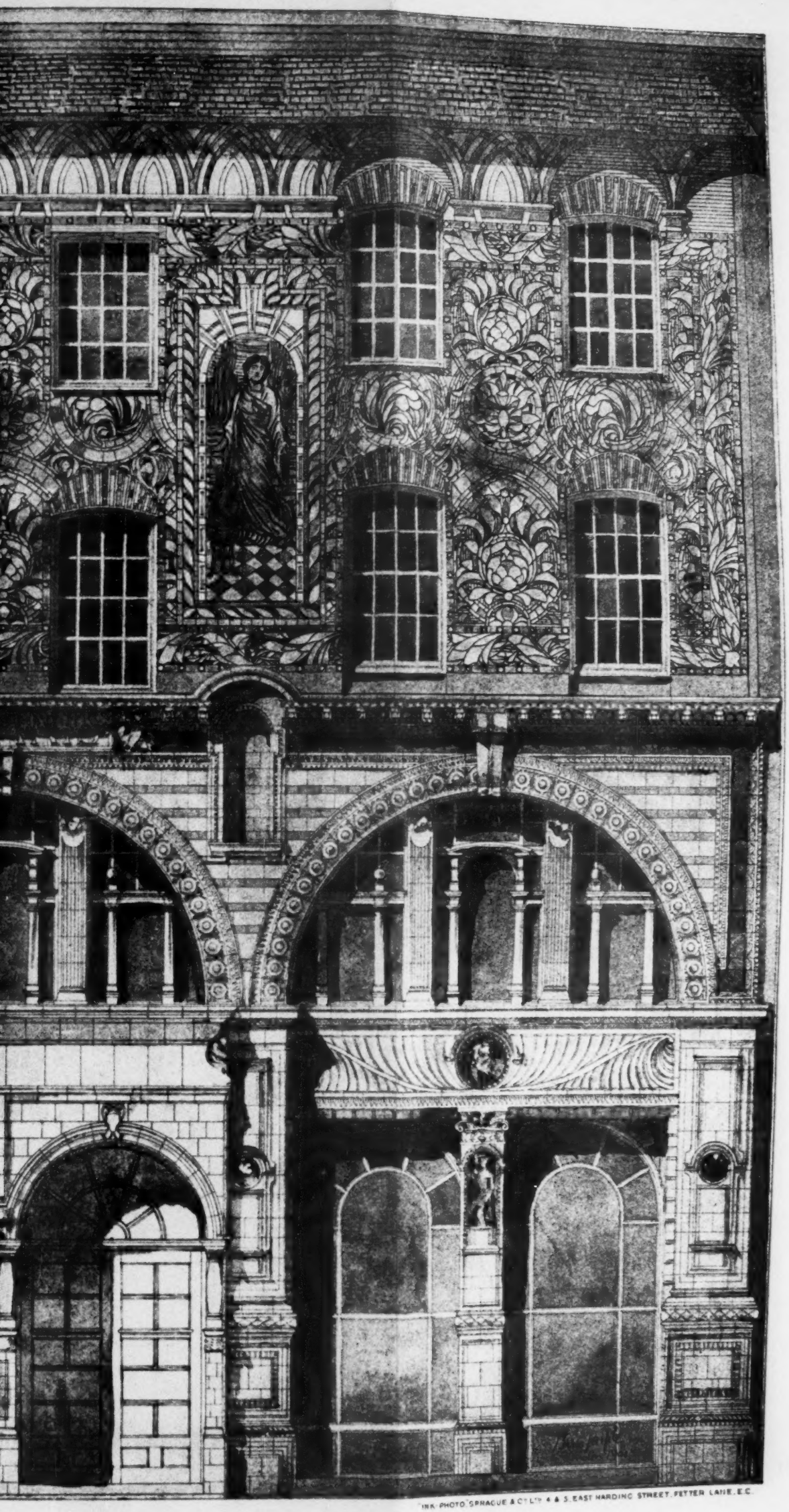

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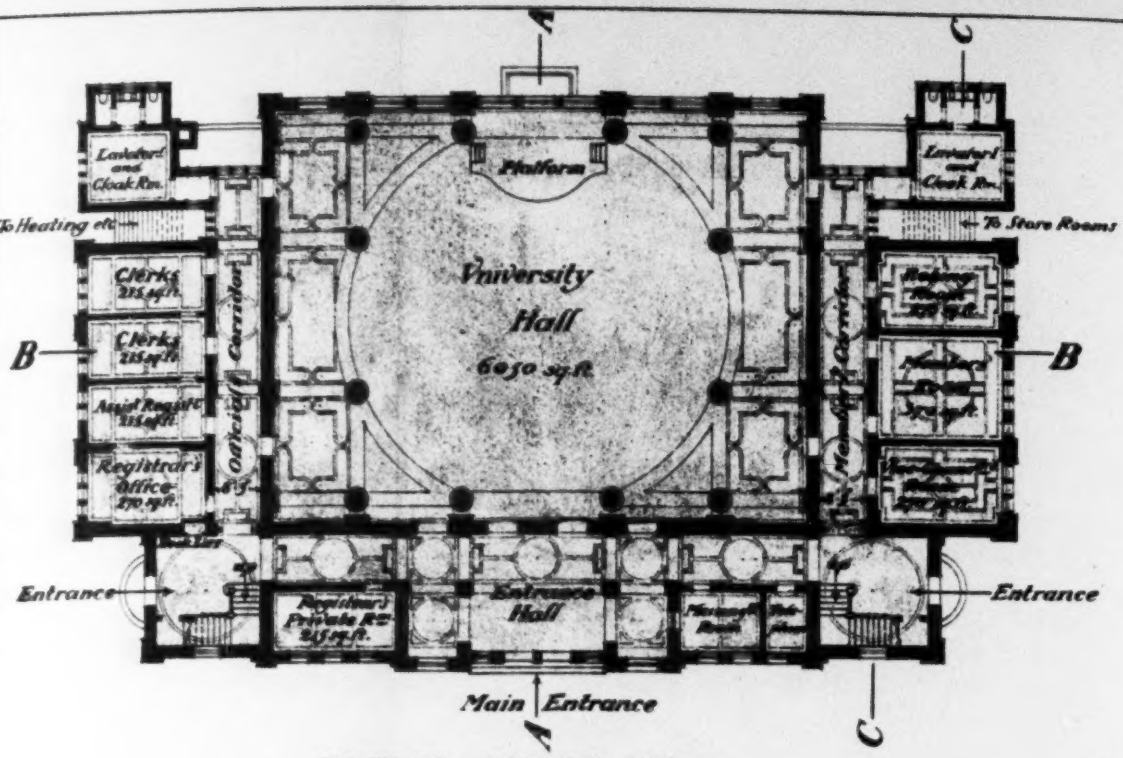
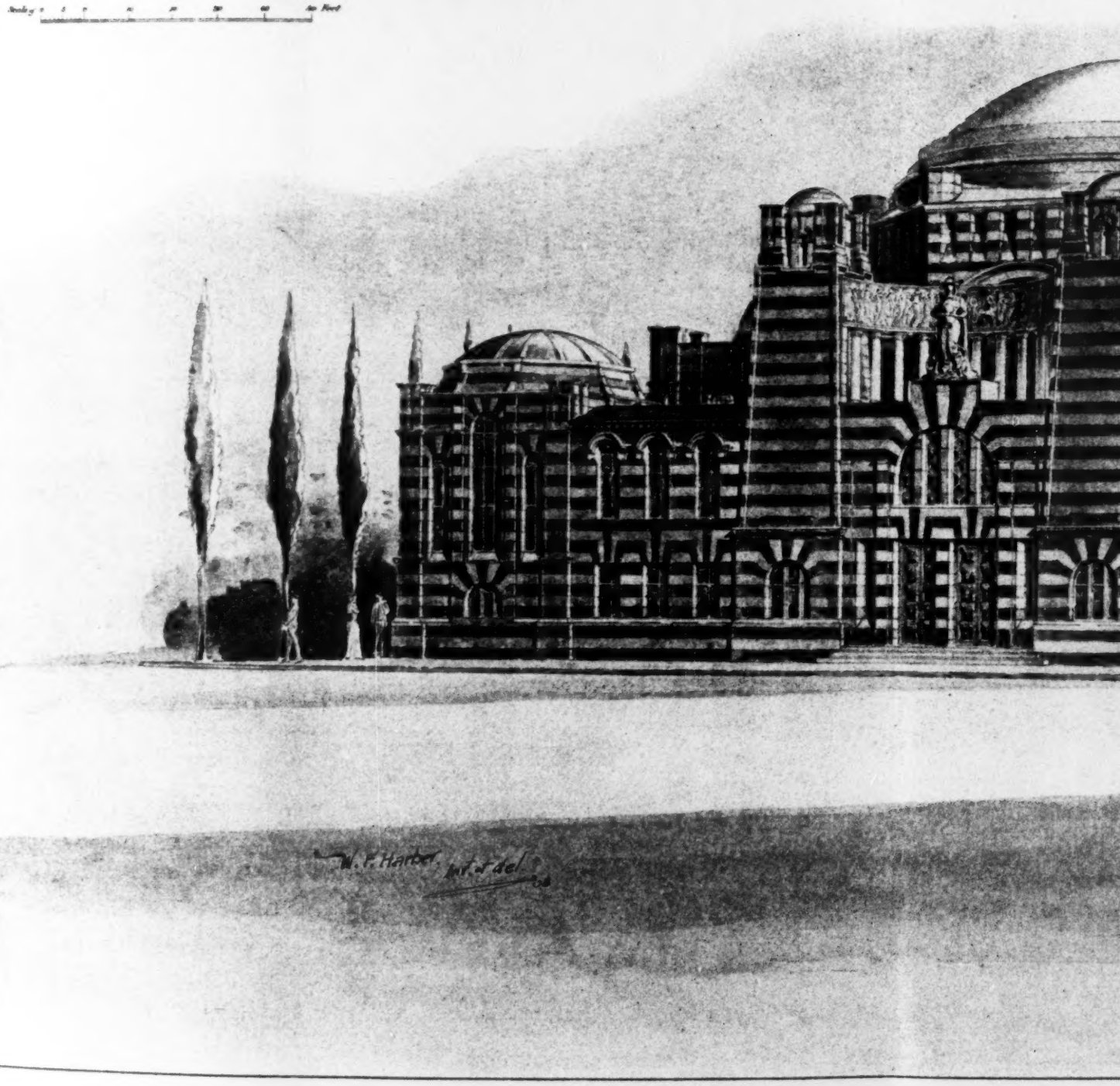
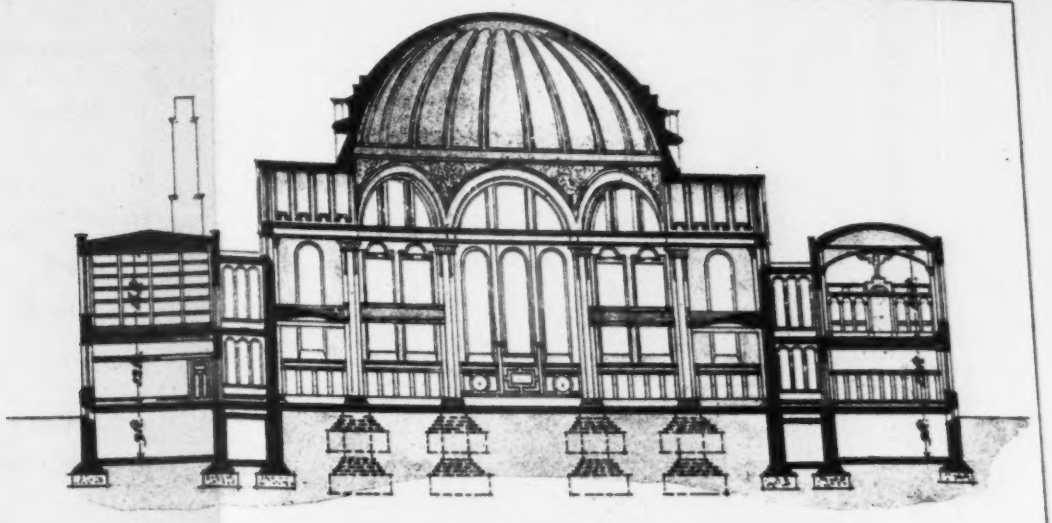


GROUND FLOOR *Plan*





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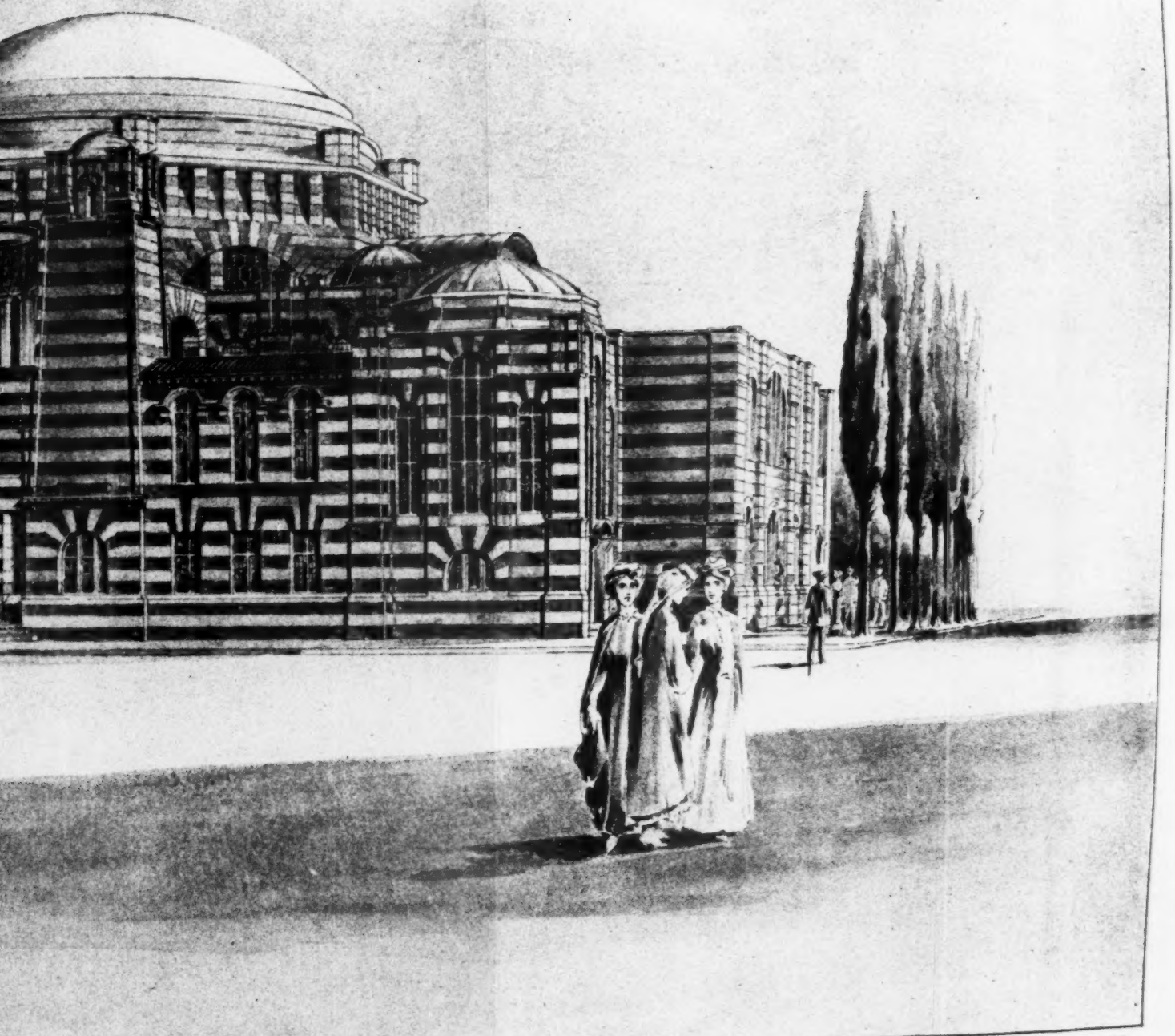

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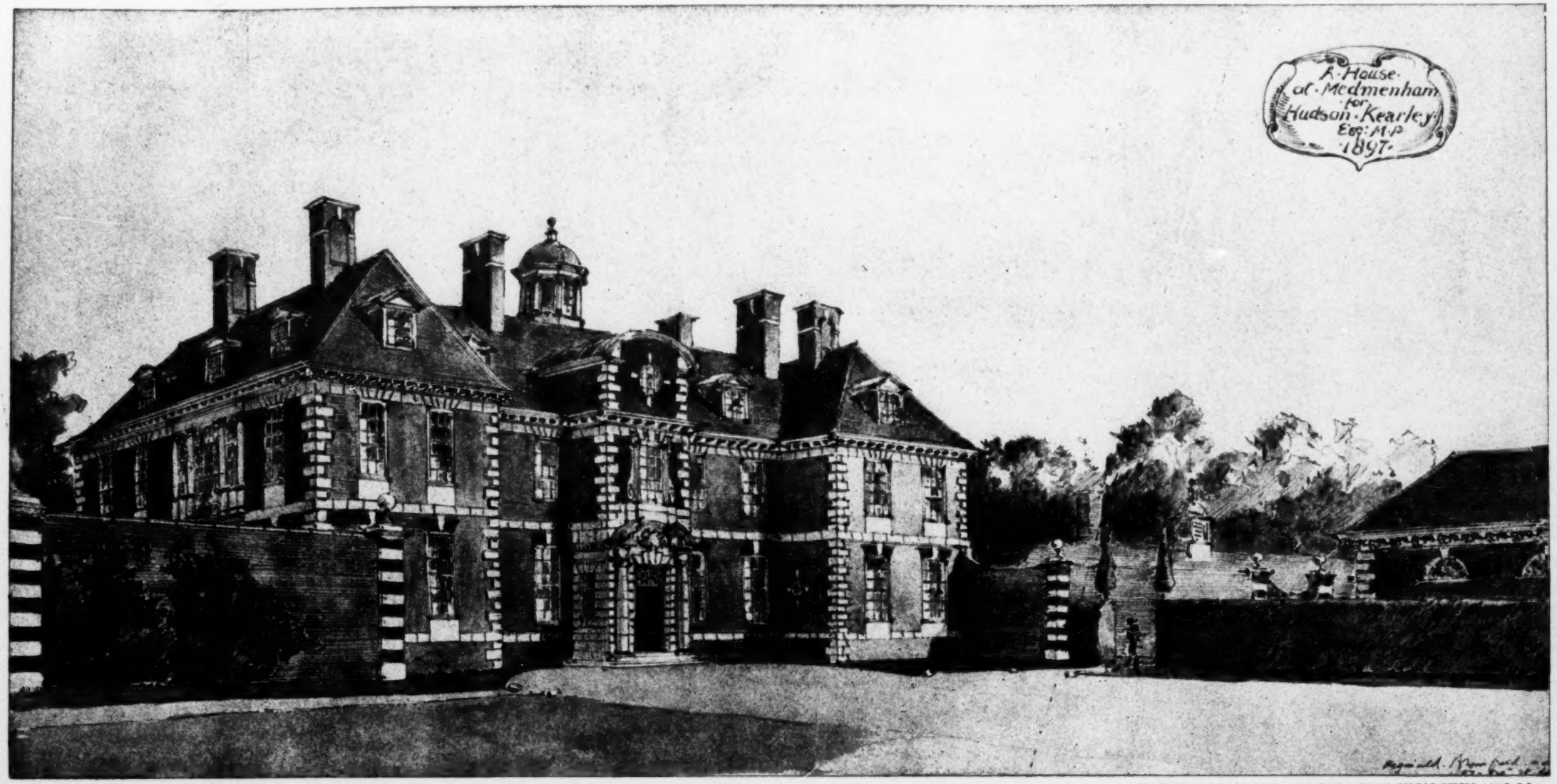
ITY BUILDINGS, CAPE TOWN.—By Mr. W. F. Harber.

A House at Medmenham for Hudson Kearley Esq: M.P. 1897.



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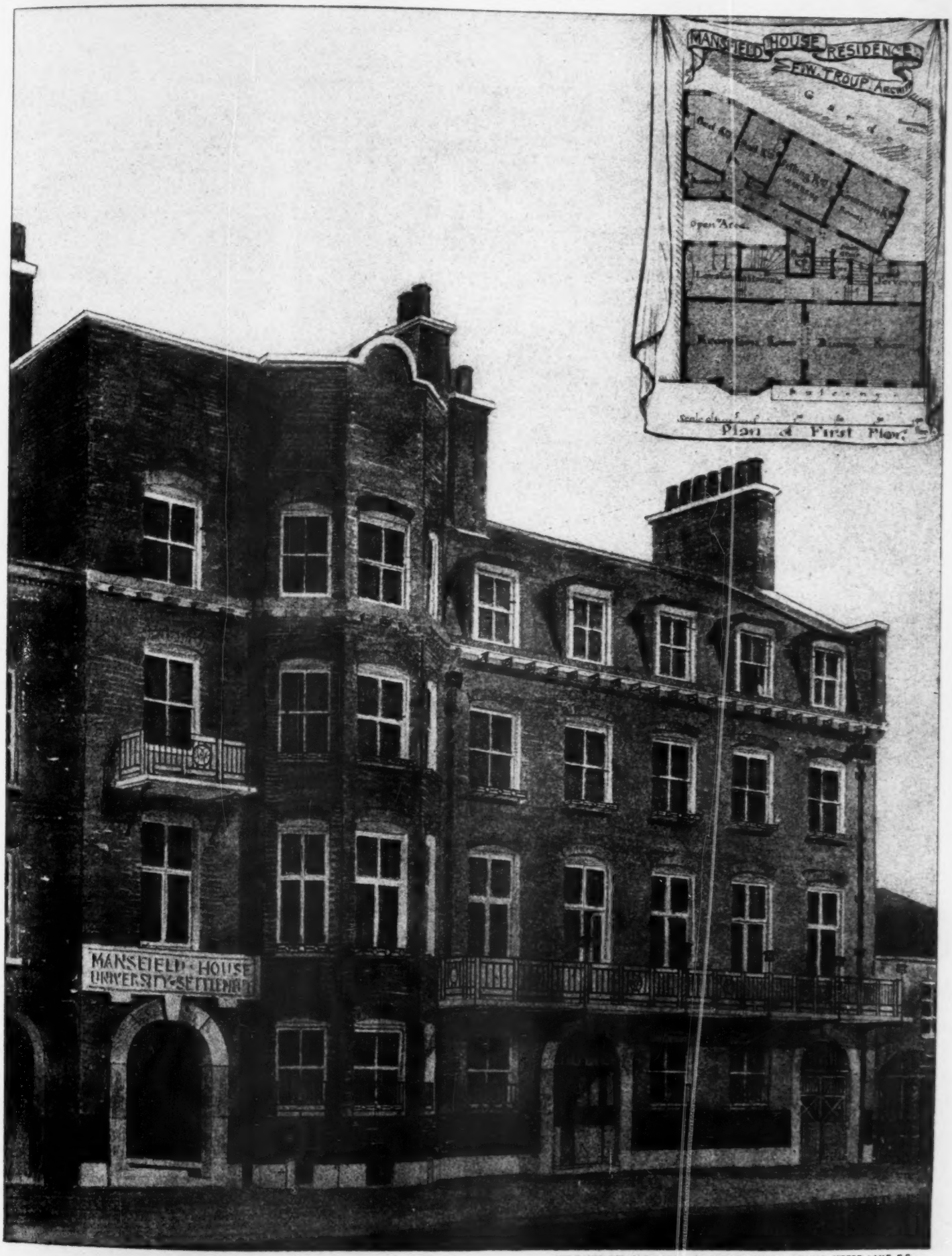
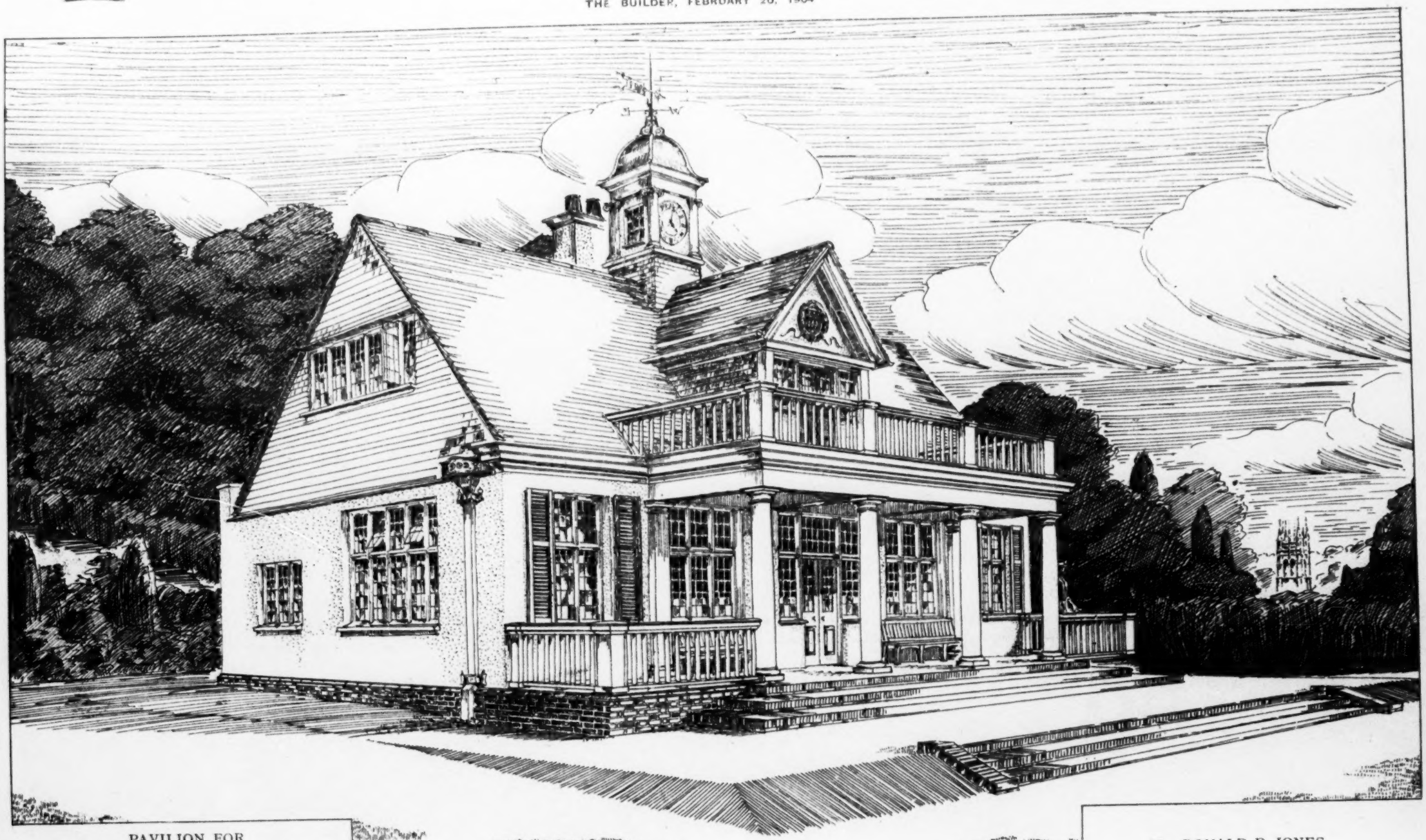


HALF-TONE PHOTO. SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

RESIDENCE FOR MANSFIELD HOUSE UNIVERSITY SETTLEMENT, CANNING TOWN, E

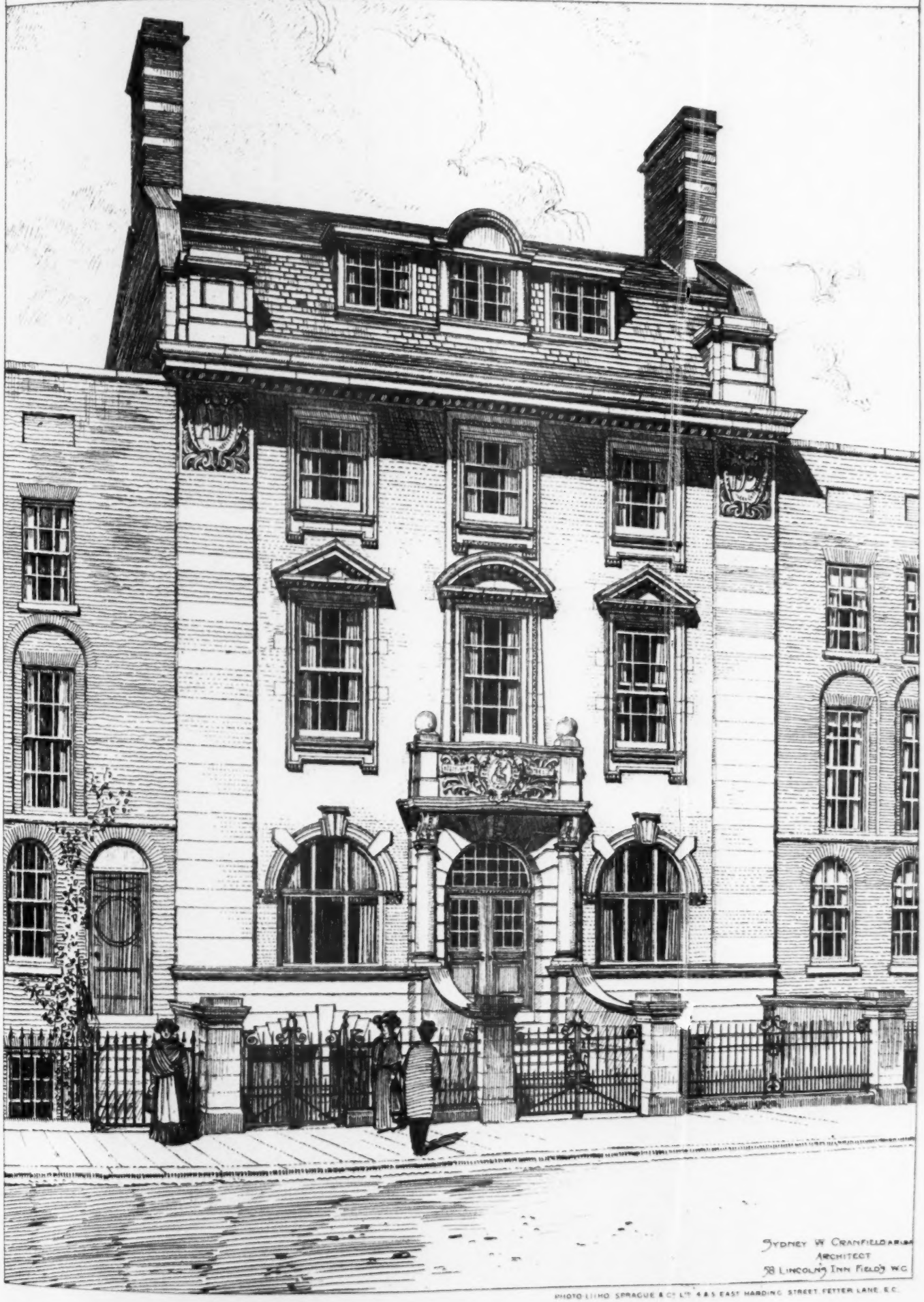
MR. F. W. TROUP, F.R.I.B.A., ARCHITECT.



PAVILION FOR
THE CONSOLIDATED CLUBS,
MAGDALEN COLLEGE,
OXFORD.

Mr. RONALD P. JONES,
Architect.

Borough of Shoreditch Constitutional Club E.C.

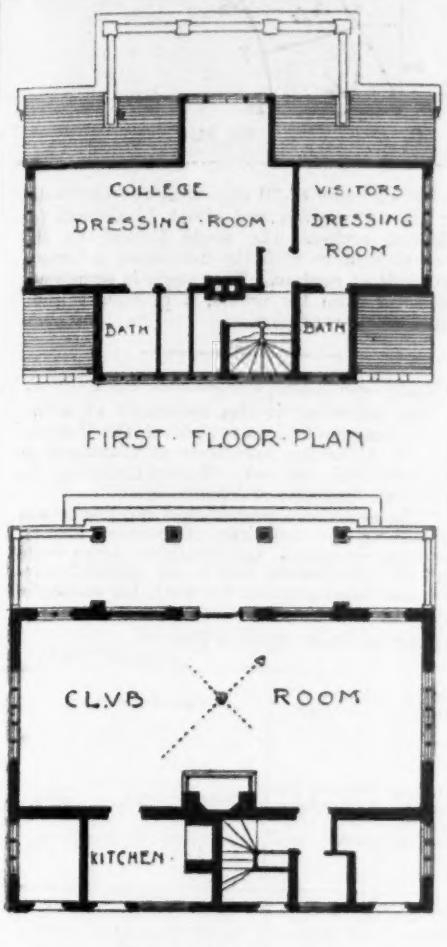


Sydney W. Cranfield A.R.I.B.A.
Architect
38 Lincoln's Inn Fields W.C.

Photo Litho. Sprague & Co. Ltd. 4 & 5 East Harding Street Fetter Lane, E.C.

floor a club room 40 ft. by 18 ft., with a paved terrace and loggia in front, and kitchen, etc., at the back. On the first floor are college and visitors' dressing-rooms with hot and cold water supply, and bathrooms, etc.

The exterior is faced on the ground floor with yellow roughcast, and the roof and walls of the



Building for the Consolidated Clubs, Oxford. Plans.

first floor are covered with special sand-faced red tiles.

The contractor was Mr. J. A. Hunt, of Hoddesdon, and the work was carried out from the designs and under the superintendence of Mr. Ronald P. Jones, M.A., architect, of London; a past undergraduate of the college.

CONSTITUTIONAL CLUB, SHOREDITCH.

THE present building, which was opened in December last, has been erected by the Directors of the Borough of Shoreditch Constitutional Club, in the New North-road, Hoxton, N.E.

The accommodation provided includes:—Club room, 56 ft. by 26 ft., with retiring-room, lavatories, etc.; billiard-room, 56 ft. by 26 ft., top-lighted: entrance hall with bar, card-room, grill-room, library, stewards' apartments, bedroom accommodation for members, and registration offices. The club-room will occasionally be used as a concert hall and is provided with a separate entrance from the New North-road.

The front elevation is carried out in buff terra-cotta and red bricks. The roof is slated with Precelly green slates. The contractors are Messrs. Sabey and Sons, of Islington; the electric lighting has been carried out by Messrs. Mather Brothers, of Farringdon-street; the heating by Messrs. R. Crittall and Co.; and the terra-cotta was supplied by the Hathern Station Brick and Terra-cotta Company.

The architect is Mr. Sydney W. Cranfield.

LIBRARY AT BROCKLEY.—At the meeting of the Lewisham Borough Council on Wednesday the Libraries Committee reported that negotiations with respect to obtaining a site for the proposed Brockley Library were completed. It was decided to invite nine local architects to send in designs for the new buildings.

COMPETITIONS.

WAKEFIELD CATTLE MARKET.—The Governors of the Charities some time since advertised a competition for plans for the reconstruction of the Cattle Market, and Mr. Vickers Edwards, the Architect to the West Riding County Council, consented to act as assessor. Fourteen designs were sent in. The first premium (50 guineas) has been awarded to Mr. C. W. Richardson, architect, Wakefield; and the second (25 guineas) to Mr. R. J. Girling, architect, Grantham.

THE ETON MEMORIAL.—The Headmaster of Eton writes to the *Times* that the committee have decided, as a first step towards obtaining a design for the proposed memorial building, to invite Old Etonians who are architects to compete.

POLICE STATION, WINDSOR.—The competition for police and fire stations, Windsor, has resulted in the selection of the design sent in by Mr. Lewis E. Hickmott, St. Raphael's, Codrington-road, Bishopston, Bristol.

WAKEFIELD UNION WORKHOUSE.—A competition for new receiving wards, attendants' rooms, porter's lodge, and new entrance gates, Wakefield Union Workhouse, limited to the architects resident within the limits of Wakefield Union, has been decided by the guardians of the Union. Nine sets of plans were sent in under motto and were submitted to Mr. Vickers Edwards, the architect for the West Riding of Yorkshire, as assessor, who placed the following in order of merit: First premium, 25*l.*, to those under motto "Economy;" second, "Light and Air," 15*l.*; third, "Vagrant," 5*l.* Upon opening the sealed envelopes "Economy" was found to be by Mr. John Day, 89, Kirkgate, Wakefield; "Light and Air," by Mr. Thornton, King-street, Wakefield; "Vagrant," by Mr. Newbald, King-street, Wakefield. The guardians adopted the report of their assessor and subsequently appointed Mr. John Day to carry out the works as their architect.

BOOKS RECEIVED.

UP-TO-DATE TABLES OF WEIGHTS AND MEASURES. By Alfred J. Martin, F.S.I. (T. Fisher Unwin).

RECENT EXCAVATIONS IN THE ROMAN FORUM, 1898-1904. A Handbook. By E. Burton Brown. (John Murray, 3s. 6d.)

STATELY HOMES IN AMERICA. By Harry W. Desmond and Herbert Croly. (Gay and Bird. 31s. 6d.)

THE COMMON-SENSE OF MUNICIPAL TRADING. By Bernard Shaw. (Archibald Constable and Co.)

ELEMENTARY PRINCIPLES OF GRAPHIC STATICS. By Edward Hardy. (B. T. Batsford, 3s.)

TABLE OF MULTIPLICATION, DIVISION, AND PROPOSITION: for Ready Calculation of Quantities, Wages, Wage Premiums, etc. By Robert H. Smith, M.I.M.E. (Archibald Constable and Co.)

THE YEAR'S ART: 1904. Compiled by A. C. R. Carter (Hutchinson and Co. 3s. 6d.)

The Student's Column.

ARCHES.—VIII.

THE principle of least thrust at the crown, which was briefly defined in our last article, deserves further consideration.

The segment of an arch represented in Fig. 44 is maintained in a state of equilibrium by the following separate series of forces:—

(1) The horizontal thrust Q at the crown.
(2) The reaction R at the abutment.
(3) The vertical forces w_1 w_2, etc.
(4) The horizontal forces h_1 h_2, etc.

For our present purpose it is not necessary to take into account the precise direction of the reaction R, applied at the point *b*, the exact position of which is not yet determined. As we assume the arch to be uniformly loaded over the entire span, the direction of Q may be taken to be horizontal, and we will take the point of its application to be at *a*, although the precise position of this point is as yet unknown.

Referring to Fig. 44 we see that

Q = horizontal thrust at the crown.
x_1 x_2, etc. = horizontal distances between *b* and the lines of action of the vertical forces w_1 w_2, etc., respectively.
y = perpendicular distance between *b* and the line of action of the horizontal thrust Q.
z_1 z_2, etc. = perpendicular distances between *b* and the lines of action of the horizontal forces h_1 h_2, etc.

Now, taking moments about *b*, we have:—

$$Qy = (w_1 x_1 + w_2 x_2 + \ldots w_x x_x) + (h_1 z_1 + h_2 z_2 + \ldots h_z z_z) \quad \ldots\ldots (4)$$

Whence:—

$$Q = \frac{\Sigma wx}{y} + \frac{\Sigma hz}{y} \quad \ldots\ldots (5)$$

It is evident that the value of Q is governed by the expression Σhz, which represents the sum of the moments of the horizontal component of the external forces applied to the arch. In the present case we have not assumed any knowledge as to the nature of the material supported by the arch ring, and as already explained in Article VII. (pp. 170-171), it is impossible to prophesy the exact effects likely to be produced by either masonry or earth so supported. Owing to this inability, it is usual to neglect the value of Σhz, when applying the hypothesis of least thrust at the crown.

The disregard of the factor Σhz in computations has the effect of giving a value for Q which is less than the actual value. Consequently the line of resistance corresponding with any value of Q so calculated must be nearer to the intrados at the haunches of an arch, than is the true line of resistance. Sometimes the conditions may be such that, while the line of resistance, as determined upon the assumption mentioned, is apparently in a safe position, the true line of resistance will really approach so closely to the extrados at the haunches as to threaten the stability of the arch. The development here indicated is somewhat unlikely in ordinary cases, and disregard of the factor Σhz usually leads to increased stability.

Omitting from consideration the effect of the horizontal component of the external forces, equation (5) is reduced to:—

$$Q = \frac{\Sigma wx}{y} \quad \ldots\ldots (6)$$

From the formula so modified, it is evident that the value of Q must be inversely proportional to the value of *y*.

Hence it follows, to obtain a minimum value for Q, the point of application *a* should approach as near as possible to the extradosal end of the crown joint E, consistent with stability against crushing of the stone.

By reference to Article VI., on p. 142, it will be seen that the distance of the point *a* from the outer extremity of the crown joint E should be equal to at least one-third the thickness of the arch at that place. Under this condition the average unit pressure will be one-half of the assumed unit working pressure; or, stated otherwise, double the value of the horizontal thrust Q divided by the depth of the crown joint will be equal to the unit working pressure

For the purpose of computing the value of *y*, it is necessary to know the direction of the thrust Q. In the present case we have assumed this force to be horizontal, but it should be mentioned that such an assumption is only justifiable for a symmetrical arch loaded uniformly over the whole span. When an arch is subject to heavy moving loads, as generally happens in the case of arches employed in bridge construction, the thrust at the crown cannot be horizontal under the influence of such loading, and its actual direction cannot be reliably defined even by the most complicated mathematical processes.

If the surface of the joint A is inclined, as shown in Fig. 44, the position of *b*—the point of application of R corresponding to a minimum value of that reaction—can only be found by trial, because the effect of moving *b* towards the intradosal extremity of the joint A, is to diminish the distance x_1 and simultaneously to increase the distance *y*. In practice, however, the distance of the point *b* from the inner extremity of the joint may be assumed to be equal to at least one-third of the thickness of the arch ring, whatever be the inclination of the springing joint.

In arches where the springing joint is horizontal, the position of *b* should be taken as near to the intrados as may be consistent with the crushing strength of the stone, safety being usually insured by placing the point *b* at one-third of the length of the joint measured from the intrados.

The *joint of rupture* of an arch is that joint

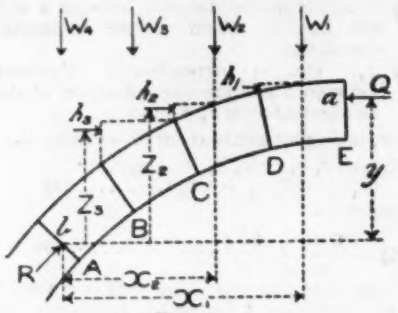


Fig. 44.

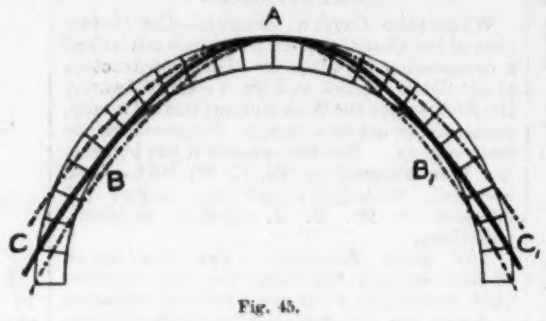


Fig. 45.

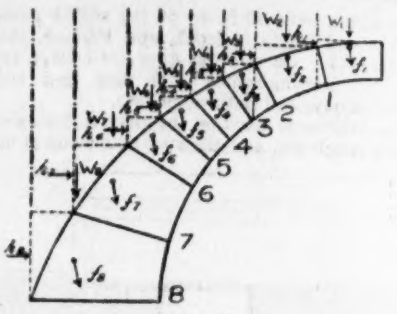


Fig. 46.

where the tendency to open at the extrados is greatest; or, otherwise defined, it is the joint at which the longest line of resistance, or linear arch, that can be drawn within the arch ring, is tangent to the extrados at the crown, and to the intrados at the haunches.

To make this matter clear we show in Fig. 45 a semi-circular arch and a series of three linear arches, all drawn for the same load, the difference in the shape of the curves being due to different horizontal thrusts. Here the heavy curve is evidently the longest linear arch that can be drawn within the ring. Any smaller horizontal thrust would give a curve such as the inner one in the diagram, and any larger horizontal thrust a curve like the outer one, and horizontal thrusts such as either of the latter are incompatible with the equilibrium of the entire arch down to the joints C C_1. If failure of the arch takes place by yielding of the abutments or of the lower portions of the ring, it will be first evidenced at the joints A, and B, B_1, where the middle curve is tangent to the arch ring, and at joint C where the curve cuts the back of the ring.

Horizontal thrusts smaller than that corresponding with the middle curve will serve to keep the voussoirs in equilibrium above and below the joints B, B_1, but unless that portion of the arch below B, B_1 and the corresponding abutments are able to resist the tendency of the arch to spread, the joints B, B_1 will open at the top, the crown joint A will open at the bottom, and the joints C, C_1 will open at the back.

The horizontal thrust necessary to make a linear arch—which is tangent to the extrados of the arch at the crown—pass through the extremity of the joint of rupture at the intrados, is greater than the horizontal thrust required to produce a linear arch passing through the extremity of any other joint in the intrados, and it is the smallest horizontal thrust consistent with equilibrium of the arch between B and B_1, and between B and C, and B_1 and C_1.

When the *apparent* springing is lower than the joint of rupture, the linear arch will fall outside the extrados at some point C, as in Fig. 45, tending to cause failure by rotation about the outer extremity of the joint affected. Such failure may be guarded against by the use of backing, and in cases where it is so used the backing really forms part of the arch, as stated in Article VII. Here we find an explanation of the work performed by backing, and one reason why the *real* arch differs in form from the *apparent* arch suggested by the visible ring of voussoirs.

It is obvious that the best method of providing backing for an arch is to make the ring thicker towards the springings, so that it may be in itself capable of resisting the forces developed. We are now able to see the reason why Rennie increased the depth of the voussoirs from the crown to the springing, as pointed out in Article II., p. 38.

The portions of the arch below the joints of rupture are often considered as parts of the abutments, and taking this view, the joint of rupture may be designated as the joint between the abutment and the springer. In order that no joint may open at the extrados, the value of horizontal thrust at the crown must be not less than that indicated by formula (5). If the thrust is of smaller value, the joint of rupture will open at the extrados, and if of greater value the conditions will be inconsistent with the hypothesis of least thrust at the crown. As the moment of the horizontal components of the external forces cannot be determined, the position of the joint of rupture must be ascertained by trial for assumed values and positions of the horizontal forces.

To illustrate this method we take an example given by Professor Ira O. Baker, showing the determination of the joint of rupture of a 16-ft. arch as employed by the Chicago, Kansas and Nebraska Railroad.* It is assumed that the arch supports an embankment of earth extending 10 ft. above the crown, and that the earth weighs 100 lbs. per cubic foot, and the masonry 160 lbs. per cubic foot. For the sake of simplicity a section of the arch one foot thick is considered. The semi-arch, shown in Fig. 46, and the earthern embankment above it are divided into eight sections, which are made smaller near the supposed position of the joint of rupture, so as to facilitate accuracy of determination. The weight of the first section rests upon the first joint, that of the first two sections upon the second joint, and so forth. The values and the positions of the lines of action of the weights of the several sections are given in the second and third columns of Table I.

TABLE I.—TO FIND THE JOINT OF RUPTURE OF ARCH RING IN FIG. 46.
(*Professor Baker.*)

Number of Joint, counting from Joint next to the Crown.	Data for Vertical Forces.		Data for Horizontal Forces.		Position of Centre of Pressure for each Joint.		Thrust at the Crown.		
	Amount of the Force.	Horizontal Distance of Point of application from the Crown Joint.	Amount of the Force.	Vertical Distance of Point of application from the top of the Crown Joint.	Horizontal Distance from the Crown Joint.	Vertical Distance from the top of the Crown Joint.	$\frac{\Sigma wx}{y}$	$\frac{\Sigma hz}{y}$	Total Thrust.
	lb.	Feet.	lb.	Feet.	Feet.	Feet.	lb.	lb.	lb.
1	2,938	1·20	66	0·10	2·20	1·18	3,866	94	3,960
2	3,045	3·57	243	0·55	4·27	1·86	7,744	308	8,052
3	1,644	5·33	192	1·17	5·27	2·42	8,518	424	8,942
4	1,716	6·45	259	1·78	6·17	3·11	**8,748**	662	**9,410**
5	1,825	7·50	315	2·53	6·98	3·90	8,577	700	9,277
6	1,888	8·47	415	3·40	7·71	4·81	8,407	941	9,348
7	3,939	9·77	1,030	5·02	8·85	6·84	7,506	1,407	8,911
8	4,098	11·05	1,624	7·70	9·50	9·25	5,990	1,983	7,973

We have already shown the difficulty of determining the value and position of the horizontal components of the external forces, but according to Rankine's theory of earth pressure† the horizontal pressure cannot be greater than three times, nor less than one third, the vertical pressure.

In the present example Professor Baker takes the horizontal intensity at one-third the vertical intensity; or, $h = (\epsilon d l) \div 3$, where ϵ = the weight of a cubic foot of earth, d = the depth of the centre of the pressed surface below the top of the earthen embankment and l = the vertical dimension of the surface. The values and positions of the horizontal forces acting upon the different sections of the arch ring are given in the table. The centre of pressure on any joint is assumed to be at a distance from the intrados equal to one-third of the length of the joint, and the co-ordinates to the several centres of pressure are given in the same table. The thrust at the crown is supposed to be applied at the upper limit of the middle third of the crown joint, the length of which is 1.25 ft., and the computed values of the crown thrust are given in the three last columns of the Table I. Inspection of the figures in the last column of this table shows that the thrust is at a maximum for joint No. 4, which may be taken as the true joint of rupture. Any increase in the assumed intensity of the horizontal components must proportionately decrease the computed value of the angle of rupture. For instance, if the quantities in the last column but one of the table be doubled, the maximum thrust will be at No. 7 joint.

As a general rule it will be found that the position of the joint of rupture is such that it makes an angle of 30 deg. with the horizontal for circular arches, and about 45 degrees for elliptical arches. The angle formed by the joint of rupture with the horizontal is termed the *angle of rupture*. This angle is sometimes measured from the crown, a practice causing unnecessary confusion.

* "Masonry Construction," p. 457.
† "Civil Engineering," p. 320.

AMERICAN PROFESSIONAL PRACTICE.

THE following is the statement of architects' charges, &c., as revised at the Convention of American Architects at Cleveland in October, 1903, and now officially issued by the American Institute of Architects :—

"The architect's professional services consist in making the necessary preliminary studies, working drawings, specifications, large scale and full size details, and in the general direction and supervision of the work, for which the minimum charge is 5 per cent. upon the cost of the work.

For new buildings, costing less than 10,000 dollars [2,000*l.*], and for furniture, monuments, decorative and cabinet work, it is usual and proper to charge a special fee in excess of the above

For alterations and additions to existing buildings, the fee is 10 per cent. upon the cost of the work.

Consultation fees for professional advice are to be paid in proportion to the importance of the questions involved.

None of the charges above enumerated covers alterations and additions to contracts, drawings, and specifications, nor professional or legal services incidental to negotiations for site, disputed party walls, right of light, measurement of work, or failure of contractors. When such services become necessary, they shall be charged for according to the time and trouble involved.

Where heating, ventilating, mechanical, electrical, and sanitary problems in a building are of such a nature as to require the assistance of a specialist, the owner is to pay for such assistance. Chemical and mechanical tests, when required, are to be paid for by the owner.

Necessary travelling expenses are to be paid by the owner.

Drawings and specifications, as instruments of service, are the property of the architect.

The architect's payments are due as his work progresses in the following order: Upon completion of the preliminary sketches, one-fifth of the entire fee; upon completion of working drawings and specifications, two-fifths; the remaining two-fifths being due from time to time in proportion to the amount of work done by the architect in his office and at the building.

Until an actual estimate is received, the charges are based upon the proposed cost of the work, and payments are received as instalments of the entire fee, which is based upon the actual cost to the owner of the building or

other work, when completed, including all fixtures necessary to render it fit for occupation. The architect is entitled to extra compensation for furniture or other articles purchased under his direction.

If any material or work used in the construction of the building be already upon the ground or come into the owner's possession without expense to him, its value is to be added to the sum actually expended upon the building before the architect's commission is computed.

In case of the abandonment or suspension of the work, the basis of settlement is as follows: Preliminary studies, a fee in accordance with the character and magnitude of the work; preliminary studies, working drawings, and specifications, three-fifths of the fee for complete services.

The supervision of an architect (as distinguished from the continuous personal superintendence which may be secured by the employment of a clerk of works) means such inspection by the architect, or his deputy, of work in studios and shops, or of a building or other work in process of erection, completion, or alteration, as he finds necessary to ascertain whether it is being executed in conformity with his drawings and specifications or directions. He is to act in constructive emergencies, to order necessary changes, and to define the true intent and meaning of the drawings and specifications, and he has authority to stop the progress of the work and order its removal when not in accordance with them.

On buildings where the constant services of a superintendent are required, a clerk of the works shall be employed by the architect at the owner's expense."

COURT OF COMMON COUNCIL.

THE usual Court of Common Council was held at the Guildhall on Thursday last week.

On the recommendation of the Sanitary Committee, it was agreed to appoint the Chairman of the Committee, Mr. W. J. Downes, the late Chairman, Mr. R. W. Edwards, and the Medical Officer of Health, Dr. W. Collingridge, as delegates to represent the Corporation, as the Sanitary Authority for the City of London, at the annual Congress and Exhibition of the Sanitary Institute, to be held at Glasgow in July next.

Mr. Carl Hentschel asked the Chairman of the Streets Committee if he had given instructions for the work in connexion with the improvement of Long-lane, West Smithfield, to be continued day and night.

The Chairman of the Committee replied that he had instructed the engineer to see that that was done, but he understood that the inclement weather of the past few nights had prevented the continuance of the work. He considered, however, that some of the officers of the Corporation had not been doing their duty with regard to the carrying on of continuous work. The whole matter would shortly come before the Committee.

Major Vickers Dunfee moved, on behalf of Mr. F. G. Dray, "That the Bridge House Estates Committee be instructed to include in the plans for rebuilding Southwark Bridge an alternative scheme for giving protection from the weather, by an arrangement of light iron and glass, to be raised above the balustrades."

Mr. Deputy Millar Wilkinson said, in the course of a short discussion, that he considered the proposal impracticable and absurd. It was calculated to make the bridge look like a greenhouse.

The motion was carried, with the addition of the words, after instructed, "to consider the advisability of including," etc.

The Port of London Sanitary Committee reported on a letter from the Under-Secretary of State for War, relative to the discharge of sewage from military establishments into the river Thames within the jurisdiction of the Port of London Sanitary Authority. On the recommendation of the Committee, it was agreed to refer the matter to the City Solicitor, to obtain, and submit to the Committee, the opinion of the Law Officers of the Corporation as to what action, if any, could be taken, with a view to preventing the pollution referred to.

The Freemen's Orphan School Committee were authorised to expend a sum not exceeding 300*l.* in the erection of iron staircase fire-escapes at each end of the school building.

MEMORIAL HALL, CASTLETOWN.—A hall in connexion with St. Margaret's Church, Castletown, near Sunderland, has been erected as a memorial of the late Colonel Charles Briggs, of Hylton Castle. The hall, which occupies a site immediately contiguous to the church, measures 60 ft. by 27 ft., and will accommodate about 400 people. The architects were Messrs. Henderson and Hall, of Sunderland, and the contract has been carried out by Mr. T. Robinson, of Washington.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week, at the City Hall, Charing Cross-road.

On the recommendation of the General Purposes Committee, it was agreed to hand over to the London County Council a stone coat-of-arms, in front of No. 8, Clare-street. The Committee reported that the arms were those of Gilbert Holles, Earl of Clare and Baron Houghton (titles apparently extinct), and bore the date 1665.

Amendments to By-laws under Sections 16 *and* 39 *of the Public Health Act*, 1891.—The General Purposes Committee reported that on presentments from the Public Health Committee and the late Works, Sewers, and Highways Committee, they had considered a letter from the London County Council, dated August 10 last, stating that that Council had under consideration the question of what amendments it was desirable should be made in the by-laws made by them under sections 16 and 39 of the Public Health (London) Act, 1891. The Council requested to be furnished with a statement of any points in which the City Council were of opinion that the by-laws required amendment. The Committee stated that the two above-mentioned Committees had made certain suggestions and observations, which had been considered by them (the General Purposes Committee). The following were the amendments suggested:—

By-laws under Section 16.

By-laws Nos. 1 *and* 2. [*Also No.* 25 *of By-laws under Section* 39 (1).]

That the by-laws be altered so as to permit of offensive refuse being removed between the hours of 12 midnight and 9 a.m. all the year round, and that under any circumstances the following exemption clause be inserted:—

"This by-law shall not apply to any person removing or carrying, or causing to be removed or carried, such fæcal or offensive or noxious matter or liquid, deposited in an impervious air-tight receptacle or receptacles, and removed or carried in the same impervious air-tight receptacle or receptacles—such receptacle or receptacles being cleansed periodically as required."

By-law No. 8.

That the word "suitable" or "properly covered" be added before the words "movable receptacle."

By-laws under Section 39.

By-law No. 1.

That words be introduced which would allow of water-closets being placed on the top floors of houses where the roof might be taken as the external wall with proper louvred lights, and with a view also to meeting the difficulty introduced by the Building Act, which permits of the ground floor of a building being entirely built over, the roof of such building might be taken as the external wall when the area of part of the ground floor extending beyond the main building is not less than 40 ft. in extent and efficient ventilation is obtainable.

That in the last paragraph of the by-law the words "constructed below the surface of the ground, and" be omitted.

That it is desirable that the floors of all water-closets be constructed of impervious material. (At present this requirement is only applicable in the case of external water-closets.)

By-law No. 2.

That the area of the window prescribed, viz., 2 sq. ft., is insufficient for the purpose of effectively lighting the water-closet, and should therefore be increased.

By-law No. 14.

That a new by-law be made that would prevent any subsequent structural alterations being made in premises which would in any way cause non-compliance with these by-laws.

That by-law No. 14 be amended so as to require the giving of notice to the Sanitary Authority of any structural alterations that may be made to a water-closet subsequent to its erection, as well as the giving of notice in regard to its erection, etc.

By-law No. 25. [*Also No.* 1 *of By-laws under Section* 16 (2).]

That where the receptacle is a suitable covered carriage, cart, or other contrivance in which the dung of horses or other cattle with stable litter is stored, and which is removed without disturbing the contents, this by-law should not apply.

The Committee recommended, and it was agreed, "that the London County Council be informed that the City Council are of opinion that the by-laws should be amended in the manner suggested in the above statement."

Projections over the Public Way.—The report of the Works Committee contained the following statement with regard to the authority for sanctioning projections over the public way:—

"Upon the notifications from the London County Council of their decisions on applications under the London Building Act, 1894, being submitted to us, our attention was called to the fact that one notification referred to the retention of an illuminated sign at the Tivoli Restaurant, Strand. Upon this application being first notified to us by the London County Council, we pointed out that the section of the London Building Act under which the application was stated to be made does not apply to this class of projection, and that the London County Council have no power to deal with the application, but that they should make by-laws for the regulation of lamps, signs, and other structures overhanging the public way, pursuant to section 164 (1) of the London Building Act.

"The Act provides that on such by-laws being made they shall be administered by the local authority. Ever since the passing of the Act, the London County Council and the various local authorities have differed with regard to this question, and although upon more than one occasion the County Council have drafted by-laws, the draft has not commended itself to the authorities whose duty it would be to administer the by-laws, and, as a result, the by-laws have not been confirmed.

"The obvious intention of the legislature when passing the London Building Act was that projections of the character above described should be the subject of by-laws to be administered by the local authority, and we are of opinion that the difficulties which have arisen are caused by the failure of the London County Council to make reasonable by-laws for such purpose, although the Act has been in force for over eight years.

"Under these circumstances we have suggested to the Building Act Committee of the London County Council that a small Sub-Committee of our members, consisting of the Mayor, our Chairman and Vice-Chairman, and Alderman Everitt, should meet them and discuss the whole question, with a view to steps being taken for its settlement."

The same Committee recommended, and it was agreed, that the City Engineer be authorised to carry out additional works at the jetties at Grosvenor-road Wharf, in accordance with the requirements of the Thames Conservancy. The estimated cost is 150*l.*

The Committee further reported on a letter received from the Wandsworth Borough Council, forwarding a copy of the following resolution passed by that Council:—

"That where any 'new street' which is within the provisions of the Metropolis Management Acts relating to the paving of new streets or any part of such street, abuts on one side on any open space dedicated to or held for the recreation or benefit of the public, a fair proportion of the cost of the first paving of such streets or part of a street ought to be charged against the said open space, and be borne by the body or persons answerable for the maintenance of such open space in the same manner and to the same extent as if such open space was land belonging to a private owner, and that the London County Council be requested to take such steps as may be proper for giving Parliamentary sanction to the above-stated principle."

The Committee stated that they had been informed that cases similar to that referred to were not likely to occur in Westminster, and that therefore the Council had not sufficient knowledge on the subject to form an opinion. It was agreed to inform the Wandsworth Council accordingly.

The Council, having transacted other business, adjourned.

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of the Commission, under Sir David Barbour, on Friday last week, further evidence was given by Mr. J. E. Waller, M.Inst.C.E., who strongly advocated the establishment of a Traffic Board, which, he would prefer, should be a Government department, and deal with tramways over the whole of the country. In the case of municipal tramways, where there was a loss on the working, he thought the Traffic Board should be allowed to come in and deal with the rates of pay, hours of labour, etc., of the employees. He suggested that the Board should invite companies to make offers for working the tramways on lease, and, if the offers made were favourable, the working should be taken out of the hands of the municipalities.

Mr. C. E. Baker, Hon. Secretary of the Urban District Councils Association, said he was in favour of an independent tribunal to deal with the traffic in and out of London. He considered that there should be more main radiating roads out of London, to be constructed by widening and straightening existing lines. With regard to the widening of High-street, Brentford, to make it more suitable for tramway purposes, it would be a

serious burden on the locality if the local authority had to pay for the widening.

Mr. C. G. Mott, Chairman of the City and South London Railway Co. for the past eighteen years, said he considered that they could only look for serious relief of the future growing traffic of the Metropolis to the construction of deep-level underground railways. He pointed out the impossibility of such railways going under private property, because they had to pay for the sub-soil. While the cost of the sub-soil was not great, the legal costs of conveyance were very heavy, and he felt that Parliament might fix some uniform sum to be paid, and so avoid legal expense. The witness sketched the history of the City and South London Railway Company, and strongly advocated the construction of subways, by which different underground stations could be linked up. He favoured the existing system of procedure in the case of Parliamentary bills, but urged that a permanent committee might be appointed, consisting of members of the Board of Trade, Home Office, and Local Government Board, which should sit frequently and report to Parliament at the commencement of each session on all bills affecting railways in the Metropolitan area, and such reports should be referred to the various committees to whom the bills are sent. The permanent committee should also have as one of its duties the constant consideration of how best to improve the means of locomotion, and to draw out comprehensive plans for that purpose. It should have power to make suggestions to the County Council and Borough Councils upon any matters where it considered improvements could be made with regard to traffic.

Mr. A. E. Gathorne Hardy, Chairman of the East London Railway, suggested that in any measures taken for the improvement of the means of locomotion, by the development of intercommunication between railways and tramways, due consideration should be given to the position of the East London Railway.

OBITUARY.

MR. ROBERT ELLIN.—We learn from New York of the death of Mr. Robert Ellin, an architectural stone and wood carver, who was an Englishman by birth, and commenced his work in this country, but in 1867 emigrated to the United States, and made a great success in New York, where he founded the firm of Ellin and Kitson. He was looked upon, according to the *New York Herald*, as "The founder of the artistic stone-carving business in New York." To have started and carried on a large firm, with many working under him, Mr. Kitson must, of course, have had other qualities and abilities besides those of talent as a carver. Mr. Ellin executed the carving on the exterior of the house of Mr. W. K. Vanderbilt, and the wood carving in the hall and stairway and dining-room; and his firm carried out the exterior and interior carving on the house of Mr. Cornelius Vanderbilt; also that on the marble arch in Central Park, and many other works.

MR. EMANUEL.—We regret to announce the death on Sunday, February 14, at his residence, No. 147, Harley-street, W., of Mr. Barrow Emanuel, in his sixty-third year. Mr. Emanuel was partner, with Mr. H. D. Davis and, latterly, Mr. H. C. Smart, of the firm of Messrs. Davis and Emanuel, of No. 2, Finsbury-circus, E.C. He was a native of Portsmouth, he graduated M.A. at Trinity College, Dublin, and was a Justice of the Peace for the County of Middlesex. Of the architectural works carried out by the firm the following have been illustrated in *The Builder*:—The Kent-street, Portsea, Schools for Portsmouth School Board, jointly with Messrs. Mileham and Kennedy (May 2, 1874); the City of London School, Victoria Embankment, for which they won the first premium in competition, and subsequently modified the plans of the premiated design for the School Committee (May 15, 1880, and, interior of the great hall, December 16, 1882); a block of buildings in Cartwright-street, Royal Mint-street, for the East-end Dwellings Company, as architects to the company (March 28, 1885); the Yarrow Home for Convalescent Children, Broadstairs (August 3, 1895); and the Synagogue in Lauderdale-road, Maida-hill (December 26, 1896). The firm were appointed architects of, and carried out, the Albert-road, Portsmouth, School Board Schools, jointly with Messrs. Mileham and Kennedy; the Synagogue in Upper Berkeley-street, W., in competition; the East London Synagogue at Stepney-green; premises in Throgmorton-street, E.C.; a block of industrial dwellings, Gibson's Buildings, at Stoke Newington (1884); a block in Cromer-street, Gray's-inn-road, for the East-end Dwellings Company (1891); and some buildings in Lloyd's-avenue, E.C., after they had laid out that new thoroughfare from Crutched-friars to Fenchurch-street. They were architects also of the branch offices of the London and Joint Stock Bank, erected upon the site of St. Michael's Church, Wood-street, E.C. (1898); the Convalescent Home for the London Hospital Extension at Felixstowe; the house on the site of the stabling and part of the garden of No. 147, Harley-street (1897); the offices, at Nos. 60-62, Finsbury-pavement, of the North Metropolitan Tramways Company and Provident Society; etc., etc. On January 1, 1902, Mr. Emanuel and Mr. H. D. Davis took into partnership Mr. H. C. Smart, who had been in their office for a period of fifteen years, but made no change in the style of the firm. Mr. Emanuel was a member of the Jewish Board of Guardians, and of the Council of the Anglo-Jewish Association; he took a warm interest in the housing of the industrial classes.

GENERAL BUILDING NEWS.

ST. JOHN'S CHURCH, KIDDERMINSTER.—The Church of St. John, Kidderminter, has just been reopened after restoration. In 1891, when it was found that the old blue brick church was quite inadequate to the growing needs of the congregation, reconstruction and enlargement in some form was decided on. The first and second portions of the scheme were carried out in 1893-4, at the cost of nearly 10,000*l*. These consisted of a new nave, 24 ft. wide and 90 ft. long, on the north side of the old church, with a chancel and apse at the east end 44 ft. long, a north aisle, and also a vestry. During the last year, workmen have again been busy in the church transforming the old portion to be in harmony with the newer work. The old flat roof and the plaster walls have now disappeared, and their place is taken by a nave aisle, south aisle, and transept, built of red and buff brick, with Bath stone columns, shafts, and mouldings, and an open timbered roof running from end to end of the same character as that of the nave. The new arcade is somewhat similar to the others, and carries a clerestory, with perpendicular traceried windows. At the east end of the nave aisle the old apse has been reconstructed in redstone, harmonising with the chancel and chancel apse, and the reredos has been cleaned. The transept extending southwards, terminated by the south porch, is the principal entrance to the church. This south porch is a prominent feature outside. The entrance archway is moulded and traceried, surmounted by a niche and canopy, in which some day is to placed a carved figure of St. John the Baptist. The total length of the church inside is 134 ft., and it is 74 ft. wide, with the south transept 20 ft. in addition. There are now three arcades in the church. The church accommodates over 1,000 people. The work has been carried out by Messrs Collins and Godfrey, builders, of Tewkesbury, from the designs of Messrs. J. A. Chatwin and Son, of Birmingham.

CATHOLIC CHURCH, SWANAGE.—The Bishop of Plymouth recently laid the foundation-stone of the new church to be dedicated to the Holy Ghost and St. Edward King and Martyr, which is to be erected at Swanage. The site is situated at the corner of Victoria-avenue and Rempstone-road, and the church will be erected from the designs of the architects, Messrs. Scoles and Raymonds, of Basingstoke. The builders are Messrs. Parsons and Hayter. The church will consist of nave, sanctuary, aisles, side chapels, and sacristy, though only the nave and transept chapel (which will be used as a sacristy) are to be built at present. The nave will be 61 ft. long and 22 ft. wide, and will be entered from a narthex porch, to which there will be two outer doors, and it will also contain the staircase to the organ gallery, situated above the porch. The walls will be faced on the outside with Purbeck stone, random coursed and rock faced, and the dressings and freestone will be of the same kind. Facing Victoria-avenue will be the main entrance, which will be recessed, and with a moulded arched head, the tympanum being filled in with carving. Over this doorway will be a four-light tracery window. There will be two niches for statues, one in the side wall of the nave, and the other in the gable of the chapel. The roof will be covered with tiles, and at the intersection of the nave with sanctuary there will rise above it a bell turret. On the inside the walls will be finished in tinted stucco, and the stone-work will be of Bath stone. The ceiling of nave will be white in panels, with the intersecting wooden ribs stained dark, and the ceiling of chapel will be of pitch-pine. On the right a stone arch will open to the chapel, and opposite to it a small archway, for the present to be blocked up, will show where the entrance from the future sacristy will be. The big chancel arch, about 27 ft. high, will also be blocked up by a temporary wall, and 14 ft. of the nave will be raised above the general floor level for a sanctuary until the permanent one can be built.—*Tablet*.

WESLEYAN MISSION CHURCH, ST. PHILIP'S MARSH, BRISTOL.—The memorial-stones have just been laid of a new Wesleyan Church in Victoria-road, St. Philip's Marsh. The hall will consist of a nave, with short aisles on either side. The nave is 45 ft. 9 in. long by 24 ft. wide, with a platform at the back raised above the nave. There will be a gallery round three sides, supported by iron stanchions encased in wood, and approached by two staircases. There are three entrances leading directly into the hall; two of these entrances lead to the gallery. There is a fourth entrance through the minister's vestry. The hall roof will be in one span, and will rise to a height of 27 ft. to the ceiling line, and 31 ft. 6 in. to the ridge of the roof. The building will be lighted by a five-light, semi-circular window in the front gable, and also by ten two-light windows, five on each side, four under and six above the gallery, to be filled with cathedral glass in lead lights. There are six class-rooms; three school class-rooms, average size 11 ft. by 8 ft.; one Bible class-room, 24 ft. by 15 ft.; one infants' class-room, 24 ft. by 11 ft.; and a minister's vestry, 13 ft. by 11 ft. There is also a library, and a scullery for tea meeting purposes, in connexion with a heating apparatus chamber in the basement, 17 ft. by 10 ft. 6 in. in size. The various school class-rooms can be thrown into the hall by the removal of screens and curtains. For Sunday school purposes and for social meetings the hall will accommodate 450—254 on the ground floor and 196 in the gallery. The walls throughout are to be of hard-burnt bricks, faced with Cattybrook bricks. The stone dressings are to be of Monks Park Bath stone. Mr. Robert Curwen, London, is the architect; and Mr. W. Foster, Bristol, is the builder; while Mr. G. Bright, of Newtown, Bristol, is acting as clerk of works.

METHODIST CHURCH, HEXHAM.—Plans have been selected by the Trustees of the Hexham Free Methodist Church for a new church and schools to be built in the Fair Field at the west end of Hexham, and opposite Leazes-terrace and Shaftoe-leazes. The design selected was submitted by Mr. T. E. Davidson, architect, of Newcastle and London.

UNITED METHODIST FREE CHURCH, LOSTOCK HALL, NEAR PRESTON.—Plans have been passed for a new United Methodist Free Church at Lostock Hall, near Preston, and the foundation-stone will be laid in April. The church will be erected from the plans of Mr. Dinsley, of Chorley, and the estimated cost is about 3,200*l*. It will be built on a site in Watkin-lane, in the grounds of Lostock House.

SCHOOLS, ATHERTON, LANCASHIRE. — The National Schools at Atherton have been re-opened after alterations and additions. The old buildings have been repaired and remodelled, and converted into a junior school, arranged with six class-rooms opening out of a central hall. A new school for the upper standards opens out from the old building. It has its own separate entrances and cloak-rooms, and consists of a central hall surrounded by five class-rooms, one of which is fitted up for cookery class-rooms. The old and new buildings are so connected that they may be conducted under the supervision of one headmaster. The schools provide accommodation for 620 children. Mr. Isaac Taylor is the architect, and Mr. John Dickinson, of Bolton, the general contractor.

SCHOOL, PUDSEY.—A school-room, built from plans prepared by Mr. Applevard, of Bramley, and erected at a cost of 1,112*l*., in connexion with the United Methodist Free Church, Bethel Chapel, Lowtown, Pudsey, was opened recently.

TECHNICAL SCHOOL AND FREE LIBRARY, BRIERLEY HILL.—The building which has been erected in Brierley Hill for the joint accommodation of the Technical Institute and Public Library was opened a few days ago. It is situated at the junction of Moor-street and Bell-street, the entrance to the technical school being in the former, and to the library in the latter street. Mr. J. Lewis Harpur, Surveyor to the Urban Council, is the architect.

INFECTIOUS DISEASES HOSPITAL FOR STRANRAER.—The Local Government Board having recommended a new Infectious Diseases Hospital for the burgh of Stranraer and the Upper District Committee of the County Council, a meeting of Stranraer Town Council was held on Monday night, at which it was agreed to adopt the plans and specifications prepared by Messrs. Spiers and Co., Glasgow, for a new structure to be built of iron and wood.

AUCTION MART, SHREWSBURY.—A new covered auction mart has been erected in the Smithfield, Shrewsbury, by the Corporation, for special sales of store cattle. The building has cost 1,000*l*., and has been erected from the designs of Mr. Eddowes, the Borough Surveyor.

NEW HOTEL AND STABLES, CROYDE, BARNSTAPLE.—It is proposed to build a new hotel and stables at Croyde, Barnstaple. Plans have

been prepared by Mr. J. C. Southcombe, architect, and the total cost of the work will be under 3,000*l.*

LODGING-HOUSE FOR WOMEN AT SOUTHAMPTON.—The foundation-stone has just been laid of the new lodging-house for women, which is the result of the conversion of the Ragged School and Palk Memorial Home, at Houndwell, Southampton. The new premises will provide accommodation for between fifty and sixty women. Messrs. Jurd and Sanders were the architects, and the work has been carried out by Messrs. H. Stevens and Co.

SANITARY AND ENGINEERING NEWS.

CONCRETE-STEEL BRIDGES AT ROCHDALE.—Two works now in course of construction at Rochdale are interesting, although not monumental, examples of the usefulness of concrete-steel. One is a covering for the river Roch, in the centre of the town, for a length of 300 ft. by 60 ft., so as to form an open space which will be used as a sort of terminal for a system of electric tramways, and the other comprises two arch bridges, each of 24 ft. span, to carry a new street 45 ft. wide over the river Spodden. With regard to the river covering, we may point out that concrete-steel, besides offering advantages in the way of construction, is a particularly suitable material for a structure exposed on the underside to vapour emanating from the river. The continual examination and painting that would have been absolutely essential in the case of ordinary steel construction will be entirely avoided, thus effecting a great saving in the way of maintenance. In the case of the two bridges, the special reason for the adoption of concrete-steel has been the difficulties presented by the presence of old colliery workings under the sites. These workings contain water, which is being pumped out and used for industrial purposes, and, after careful consideration, it was decided to annul a contract already let for the construction of steel bridges. The new bridges are founded on concrete-steel piles, passing through the old workings into the clay beneath, and the foundations provide for possible alteration of the river bed, which may arise at some future time if adjoining weirs should be abandoned.

SANITARY ASSURANCE ASSOCIATION.—The twenty-third annual meeting of the members of this Association was held on Monday last, the 15th inst., at the offices, 5, Argyll-place, W., Mr. Andrew Stirling, President, in the chair. In the annual report the council expressed regret that the principle of a Sanitary Registration Bill, promoted by the Association, has not yet received the sanction of Parliament. The income of the year was 202*l.* 15*s.* 7*d.*, which, after meeting all liabilities, left a balance in hand. The report was adopted on the motion of the Chairman, seconded by Mr. Mark H. Judge, and the retiring members of the council, Mr. Walter Butler and Dr. Willoughby, were re-elected.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science held at Plymouth, on February 12 and 13, two candidates presented themselves. The following candidate was granted a certificate:—J. S. Knight, Tavistock.

FOREIGN.

FRANCE.—In virtue of a decree of the President of the Republic, the square forming the intersection of Rue Auber and Rue Scribe is to be named Place Charles Garnier. The newly-named "Place" is just in front of the monument to Garnier.——Mr. Charles Lefebvre has been appointed architect to the Colonial Office.——The Louvre has acquired for 90,000 francs, at a public auction, a curious antique stele, of Egyptian work, decorated on one face with a sculpture representing a hawk and a serpent. It has been found during the excavations carried out at Abydos by M. Amélineau.——It is supposed that M. Carolus-Duran is the most likely person to be elected to fill the place of Gérôme at the Académie des Beaux-Arts.——The Condé Museum at Chantilly has been enriched by various objects left to it in his will by Gérôme.——The church at Beaulieu (Indre et Loire) is to be restored, at a cost of 100,000 francs.——M. Lucien Pallez, the sculptor, has been commissioned by the Franco-Italian League to execute the statue of Victor Hugo, which is to be offered to the City of Rome.

GERMANY.—The Hotel of the Four Seasons at Münich has been enlarged and decorated; the work was carried out by the firm of Heilmann and Littmann, and the interior decorations by the artists Herr Paul Rieth and Herr Max Obermayer. Instead of the ostentatious luxury and display of costly materials usually found in modern hotels, the building has been decorated in such a manner as not only to insure bodily comfort, but also to satisfy the artistic sense.——The restoration of the Church of St. Lawrence, at Nuremberg, has been placed in the hands of Professor Josef Schmitz.

AUSTRIA.—The foundations are being laid of the new Geographical Institution in Vienna; the building is to be four stories high, and is to contain rooms for printing, lithography, and photography. The work has been entrusted to the architects Herr Stigler and Herr Siedek.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Frederick Rings, architect, Bank-chambers, Tooley-street, has entered into partnership with Mr. John Myers, of 33, Randolph-crescent, and the practice will be carried on under the style of Rings and Myers, at 21, Railway-approach, London Bridge, S.E.——Mr. Morley Clarke, civil engineer, 94, Market-street, Manchester, has taken into partnership Mr. Basil Pendleton. The practice will be carried on under the style of Morley, Clarke, and Pendleton.——The Edison and Swan Electric Light Company have opened new West-end show-rooms at 60, Great Marlborough-street, W.——Messrs. Frank Jordan and Co., 15, George-street, Mansion House, are appointed the agents for London and the south-eastern district of Messrs. Holdsworth and Sons, boiler makers, of Bradford.——Messrs. George Howson and Sons (Eastwood Sanitary Works, Hanley) have removed their London office to 20, Sandland-street, Bedford-row, W.C.——Messrs. Lane and Son, builders and decorators, 25 and 41, London-street, Kingston-on-Thames, have taken into partnership Mr. W. H. Farley, their confidential clerk for many years. The style of the firm remains as before.

FRAZZI FLOORS.—Messrs. Albert Gray and Co. send us a model of one form of the Frazzi floors, of which he is London agent. This is a form of fire-resisting floor, in which, for steel joists of from 2 ft. to 4 ft. 3 in. span, the filling is made by a hollow-chambered terra cotta beam, the bevelled ends of which rest on hollow skewbacks of the same material, which protect the steel, and are carried by the lower flange of the steel joist, which fits into a groove in the terra cotta. Thus a hollow fire-resisting ceiling is formed, which can be put up without scaffolding, and which should be a good non-conductor of sound. Upon this terra cotta beam is a concrete filling, which is entirely carried by the terra cotta. The floor appears, as far as one can judge from the model, to be an exceedingly good one, with a great deal to recommend it in the way of simplicity, lightness, and economy.

CONSISTORY COURT OF LONDON.—Dr. Tristram, K.C., Chancellor of the Diocese, has agreed to issue two faculties relating to the churches of St. Giles, Cripplegate, and St. John, Clerkenwell. In the former instance, the vicar and churchwardens sought for authority to make some alterations and improvements consequently upon the demolition of the "Quest House" and other buildings in Fore-street, and the laying out of the ground thus gained, which we lately described. The faculty will extend to (*a*) the closing up of the small round window at the east end of the north wall of the north aisle, which is now brought into view; (*b*) the erection at the north entrance into the church of an interior oak screen or lobby, for which it is proposed to use some of the old woodwork from the recently demolished church of St. Bartholomew, in Moor-lane; and (*c*) the making of a path across the church-yard to lead to the principal entrance, and the lowering, to the extent of about 2 ft. 6 in., the level of the ground thereabout. The last-named alteration is to be made concurrently with the scheme for closing a part of the old pathway, and making a new entrance into the church-yard over the land which has been bought from the Corporation of the City of London. The closing up of the comparatively modern circular window is desired in connexion with the project for restoring that portion of the north wall of the church, as far as possible, to its pristine condition. The other faculty relates to the vesting in the Finsbury Borough Council of the disused burial-ground in Benjamin-street, Turnmill-street, of the Church of St. John, Clerkenwell, which, having been closed in 1853 by an Order in Council, and being charity property, was vested in trustees by an order of the Charity Commissioners in May, 1881. A faculty was granted four years afterwards for the laying out of the burial-ground as an open space. It was laid out as a public garden, being about one quarter of an acre in extent, upon a plan supplied by the Metropolitan Public Gardens Association, at a cost of some 100*l.*, defrayed by subscriptions, and opened to the public in July, 1885. The garden has since been maintained by a committee, whose members are appointed by the Clerkenwell Vestry and the Holborn District Board of Works, both of which bodies are now represented by the Borough Council of Finsbury.

SMALL-POX HOSPITAL, MOOR CROFT, NEAR BILSTON.—It is proposed to erect the new South Staffordshire Joint Small-pox Hospital on a site at Moor Croft Colliery, near Bilston, and a Local Government Board inquiry into the matter was recently held at the Wolverhampton Town Hall, an application having been made for a loan of 15,000*l.* for the purposes of the scheme. Numerous plans were produced, and it appeared from the statement made to the Inspector (Mr. R. J. Reece, M.D.) by the Clerk (Mr. H. Brevitt) that the population of the area over which the hospital would operate is 337,387 persons, the rateable value 970,877*l.*, and acreage 34,183. It is proposed to spend 3,484*l.* on temporary buildings. The hospital would occupy a site of 49 acres, around which it is proposed to erect an iron fence at a distance of over 40 ft. An arrangement has been made with the Bilston Urban District Council for a supply of water, and a system of irrigation is to be adopted. The ward blocks will each contain sixteen beds, and the administrative block will afterwards be used as an observation building. After the completion of the works, the permanent administrative block, discharge block, lodge, laundry stables, and so forth, will be pushed forward. Mr. George Green, the architect, gave evidence, and there was no opposition.

THE EAST-END DWELLINGS COMPANY.—The report of this company to be submitted to the twenty-first ordinary general meeting on February 22 states, among other things, that the company has entered into possession of an important leasehold site, with frontages to Cromer-street and Tonbridge-street, near St. Pancras Station. The site has been cleared, and building operations commenced. The new buildings have been named "Tonbridge Houses," and will comprise 239 rooms, divided into seventy-three tenements of three rooms each, and five tenements of four rooms each, as well as accommodation for a superintendent. This site adjoins the company's Cromer-street estate, and the new buildings, when ready, can be conveniently managed therewith. There is a good demand for dwellings in the district, and it is anticipated that there will be no difficulty in letting the new buildings. The letting of the company's properties has been quite satisfactory, with the exception of the buildings in and near Victoria Park-square, and Globe-road, Bethnal Green, where it still proves difficult to secure eligible tenants in sufficient numbers. A reduced scale of rents has recently been adopted, in the hope of effecting a diminution in the number of empty rooms.

WESTON-SUPER-MARE MASTER BUILDERS' ASSOCIATION.—The annual dinner of the members of the Weston-super-Mare Master Builders' Association was held recently at Glass's Restaurant. The chair was occupied by the President of the Association, Mr. Charles Addicott, and the vice-chair by Mr. G. Stokes (Vice-President of the Association). The loyal and patriotic toasts having been honoured, Mr. W. Dyer proposed the toast of "Architects and Surveyors." They had architects in the town who were at all times ready to meet the builders in a reasonable way, as far as they could—always keeping their clients' interests in view. They tried to do the best they could for their clients without injuring the builders, and *vice versâ*.—Mr. W. Jane, in reply, said he had his doubts occasionally as to whether architects were not sometimes considered by the general public and by the builders as necessary evils, and by some as an unnecessary luxury. However, he supposed they did form a useful buffer sometimes, by taking the hard knocks of conflicting interests upon themselves.—Mr. E. T. Gillmore also responded.—Dr. Grey then proposed the toast of "The President and Vice-President of the Weston-super-Mare Master Builders' Association." If there were not such an Association what a state of things they would have! There would be a continual series of hostilities, which were now happily avoided; there would be no organised body to deal with matters affecting their trade; there would be no master man at the helm to prevent their interests going on the rocks, because their's was a trade which, from time to time, had difficulties to contend with. It had public authorities to deal with, and it required men of some considerable skill and strategy to govern its policy. Bad building could only produce bad results in the way of the diminished prosperity of the town. A health resort like Weston depended entirely for its prosperity upon its bill of health, and its bill of health depended very largely upon the builder.—The Chairman, in responding, said their business was to try, as far as it lay in their power, to keep the trade together. Building was the staple trade of the town, and if it were prosperous, other branches of trade must derive some benefit. He was sorry

to say that just at present trade was bad, but it was not only locally that it was bad, for he heard from commercial gentlemen that the same state of things prevailed nearly throughout the land.—Mr. Gilbert Stokes also replied. Other toasts followed.

MANCHESTER SHIP CANAL.—The directors have deposited a bill to authorise the company to raise the level of the water in the tidal section and to deepen the upper reaches of the Ship Canal, and to construct a diversion of the river Mersey at Warrington with a lock and sluices. A bill has been deposited by the Trafford Park Estates Ltd. and their directors, acting as promoters, the object of which is to obtain powers to construct a dock and wharves in Trafford Park, and to work them as a public dock estate. The directors consider that such powers would be injurious to the interests of the company, and they are taking steps to vigorously oppose the bill. The engineer's report for the half-year ending December 31, 1903, states that the depth of water in the Ship Canal and Docks has been fully maintained throughout the entire length of the waterway by means of the dredging operations. The deepening of the approach channel below the locks at Eastham has been completed; the timberwork of the leading jetty at the inner end of Eastham locks is well advanced towards completion; and the work required for the construction of the spare steel gates for the upper end of the 80 ft. lock is in hand. Mooring dolphins, intended for the use of vessels desiring to tie up, are in course of construction below Latchford locks. The works required for the extension of the coaling basin at Partington, and of the railways and sidings in connexion therewith, have been completed. The leading jetty at the upper end of the 65 ft. lock at Barton has been completed. A new berth, with railway connexions and sidings, is being constructed on the northerly side of the Canal at Weaste, for the accommodation of the coal traffic which is at present carried on at Salford Quay. The large group of railway sidings on the southerly side of the new dock now in course of construction has been completed. Considerable additions have been made to the timber storage ground and to the roads and railways round the docks. The embankments and slopes of the canal are generally in good condition, and the works throughout have been efficiently maintained. The works in connexion with the new dock on the site of the old racecourse, and with the transit sheds on the southerly side thereof, which are being carried out by Mr. Henry Lovatt and others, under contract with the Manchester Dock and Warehouse Extension Company, have made good progress during the half-year.

WAR MEMORIAL, LIVERPOOL.—The memorial to the members of the Liverpool Regiment who fell in the South African war, which is being executed by Mr. Goscombe John, will stand 25 ft. in height, and will have a width of the same length. The main parts of the sculpture consists in two figures of soldiers supporting a panel, on which the names of the fallen will be inscribed, and the figure of Britannia, with which the memorial is surmounted.

A RESERVOIR COLOURING BRUSH.—This, which is called in the description sent to us "reservoir colouring pen," is more intelligibly described as a colouring brush, though it fills some of the uses of a broad pen. It consists of a brush connected with, and filled from, a compressible reservoir, the action of which serves both to draw up the colour and to fill the brush again when required. The brush is clipped between two thin sheets of metal, which can be separated or brought together by a screw, so as to produce a broader or narrower brush as required, and to maintain the brush line at the same width during use. We thus have a brush available for drawing broad lines of colour of uniform width, and which can be used either with free hand or against a ruler. Such an implement can be useful in many ways—in outline colouring to maps or plans, in drawing full size mouldings, or giving a section colour to them when drawn; in making diagrams on a large scale, etc. The brush is the patent of H. G. Lloyd, and is made by Messrs. Van Neck and Co.

PORTSMOUTH MASTER BUILDERS' ASSOCIATION.—The thirty-first meeting of the Portsmouth Master Builders' Association was held at the Sussex Hotel recently, Mr. W. W. Evans presiding. The annual report and balance-sheet, having been read, was adopted. Mr. J. W. Perkins proposed the re-election of Mr. W. W. Evans as President. He said that the Association's thanks were due to Mr. Evans for the able way in which he had arranged the many difficult questions which came before him during the past year. Mr. Light having seconded, the resolution was carried *nem. con.* The President thanked the members for their confidence. Mr. A. Sprigings was then elected Vice-President, and Mr. Jones as Treasurer. The following were elected as Committee:—Messrs. G. J. Davis, Salter, J. Crockerell, Light, C. Dye, H. G. Wilkins, G. R. Chamberlain, and J. W. Perkins. Mr. Frank J. Privett, who had been Secretary for the past few years, was unable to offer himself for re-election. The President proposed a hearty vote of thanks to him for the great assistance he had always given them, and expressed regret at losing his services. Mr. Perkins, in seconding, expressed his pleasure that Mr. Privett was about to become a member of the Association, and, several members having supported, the resolution was carried unanimously. Mr. F. B. Roskell was elected Secretary, and the following as new members:—Messrs. D. Gammins, Frank J. Privett, J. Timpson, and E. J. Hoile.

NORTH STAFFORDSHIRE BUILDERS' ASSOCIATION.—Under the chairmanship of the President, Mr. J. Gallimore, J.P., the annual dinner of the N.S. Builders' Association was held recently at the North Stafford Hotel, Stoke. Mr. A. E. Tallis, secretary of the Midland Centre of the National Federation of Building Trade Employers of Great Britain and Ireland, proposed the toast of "The North Staffordshire Builders' Association." Mr. John Bagnall proposed "The Local Governing Bodies." Mr. James Heath (Leek) submitted "The Architects and Surveyors." He said that the aims of an architect must be very high, and in that district they were most fortunate, for they had men of considerable eminence. One might sympathise with the architects that they had not a more genial atmosphere to work in, otherwise the beauty of their accomplishments would be more apparent. The system of estimating was probably responsible sometimes for work which did not produce the best architectural effects, but this could not be helped. Mr. Alexander Scrivener, who responded, said that architects were placed in a very awkward position, having to exercise a judicial capacity as regarded their contracts. They had, on the one hand, to see that justice was done to their clients, and, on the other, that the builders had their rights. Mr. Heath struck rather a high note when he suggested that the architects might do better than choose the lowest tender, but it was not the architects who did it; it was the proprietor. It might be expected that he should say something about a circular which had been sent to architects as regarded contracts. Unfortunately, architects were placed in a much worse position than the builders. The latter had an excellent association, which enabled them to meet together and devise all sorts of schemes for kicking the architects. The architects were not in the same position. As architects they never met together, and there were one or two members of the profession in that room whom he did not even know. The position of the architect, unfortunately, was always insular. He always worked for himself, and by himself; they never co-operated as they ought to do. For many years past he had felt that the architects of the district ought to be associated, but they did not know who was to take the initiative. As regarded "quantities," which seemed to be a serious point in connexion with the contract, his firm were prepared—and in their last contract they had embodied it—to make the quantities part of the contract, and to adopt absolutely what the builders suggested, *i.e.*, that, if any error should be found in any of the quantities, if it were no fault of the builders in carrying out or in pricing, it should be corrected. Such errors would not vitiate the contract, but would be dealt with in the ordinary way and added to, or deducted from, as the case might be. He was bound, however, to say that, so far as his own firm's work was concerned, he thought it would be worse for the builder than for the proprietor, for they had had very few discrepancies pointed out in their quantities by the builder. They never looked into the quantities on their own part, or on their clients'. If they did do, he thought they would find that they must carry out the clause to its fullest extent, and take something off the builders, rather than let the latter put something on. Further, his firm had been prepared for many years past to consider any error in their quantities, if a builder pointed it out, and they were now putting that clause into their quantities for the future. The toast of "The Visitors" was proposed by Mr. H. Howlett, and acknowledged by Mr. A. Boulton.

FATAL BUILDING ACCIDENT.—At Westminster, on the 15th inst., an inquest was held on Henry George Cressy, aged 52, a labourer, lately living at Queen's-road, Battersea. On Friday last week, twelve pieces of timber, each about 22 ft. long and weighing 82 lb., were being hoisted some 70 ft. high at the new Gaiety Restaurant buildings. One of the pieces slipped from the sling attached to the crane, and fell, striking Cressy, inflicting injuries which caused death. James Mackintosh, the foreman, said there were from 120 to 150 men employed there. The timber would not pass over Cressy as it was being hoisted, but it was a windy day, and the timber must have been blown in his direction. A verdict of "Accidental death" was returned.

BARNSLEY FEDERATION OF BUILDING TRADE EMPLOYERS.—About fifty members of the Barnsley Federation of Building Trade Employers dined, on the 12th inst., at the Royal Hotel, Barnsley, the President, Mr. James Smith, presiding. In proposing "The National and Yorkshire Federations," Mr. G. Porter alluded to a scheme for the establishment of a building trades conciliation board. The necessity for a closer union between men and employers had been felt for some period, and the scheme now before the Yorkshire Federation was that an equal number of men and employers should form such a board. The matter was one that had received great attention, principally on account of the large number of trumped-up strikes that had taken place throughout the country, and he had hopes for its successful inauguration. The speaker referred to the fact that the financial position of the Yorkshire Federation was far better than it had ever been. Mr. E. Good responded. Referring to the labour question, he said that if their line of action was right, they should tell a man straight that he was wrong; not tell him that he was right and then tell his neighbours that he was wrong. If they could waken up to more straightforwardness on the part both of masters and men, it would be the greatest lever for bringing about a closer union between them. Councillor W. G. England also responded. Mr. J. H. Taylor, C.E., proposed "The Barnsley Federation of Building Trade Employés." The President and Mr. H. Medley responded, and Mr. T. Lindley followed with the "Mayor and Corporation of Barnsley," to which the Mayor responded.

QUEEN VICTORIA MEMORIAL SCHOOL, SCOTLAND.—The Executive Committee of the Queen Victoria Memorial School for the Sons of Scottish Sailors and Soldiers have decided, instead of acquiring any existing building, to accept the offer of a site which lies upon the property of Mr. Stirling, of Kippendavie, about four miles distant from Dunblane, and to obtain plans and estimates accordingly. Sir Rowand Anderson is a member of the Committee.

CAPITAL AND LABOUR.

MASONS' STRIKE AT SOUTHPORT.—A masons' strike has taken place in connexion with the erection of Holy Trinity Church, Southport. The reason assigned is that the stone is cut, etc., at the Bath quarries, from which it is taken, instead of on the job. Accordingly the men have been withdrawn by their Society. At Bath, the men, it is understood, are paid at the rate of 7d. per hour, whereas the rate in Southport is 9d. The President of the Southport Trades Council, at the annual meeting, said it was a very serious matter for Southport. A rule had been in force twelve years that no stone of a certain dimension should come into the town, but such stone had come. The committee of Holy Trinity Church had accepted the tender from a man outside the town, and he came into Southport, cut out the local employers re labour, and sent work into a low-paying district and got it put up in Southport, in violation of a rule. The stonemasons could not help it, and had to leave their work. A deputation was appointed from the Trades Council to join a deputation from the Stonemasons' Union, to see the committee of the church with a view to getting the grievance remedied.

Legal.

RELAYING A DRAIN.—TENANT'S LIABILITY.

THE case of Stockdale *v.* Ascherberg came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, last week, on the appeal of the defendant from a judgment of Mr. Justice Wright in the King's Bench Division.

In this case the plaintiff had let to the defendant, under an agreement in writing, a tenancy of No. 68, Brondesbury-villas, Kilburn, for the term of three years, at an annual rent of 55*l*. By the agreement, the defendant agreed "to pay all taxes, rates, assessments, and outgoings of every description for the time being payable in respect of the premises as they become due (landlord's property tax only excepted)." The defendant also agreed "to keep and leave the premises (including the fixtures) in as good condition as they are now in (reasonable wear and tear excepted)," and "to keep the gutters, stack pipes, water-closets, and cisterns clean, and to keep in repair all sash lines and internal pipes and taps." In September, 1902, the plaintiff was served with notice by the Urban District Council of Willesden, under the Public Health Act, 1875, which stated that there was a

nuisance on the premises, and that the plaintiff must abate it by taking up and relaying the existing drain. The plaintiff did this, at a cost of 83*l.* 10s., and brought the present action to recover the amount from the defendant under the agreement. Mr. Justice Wright held that the defendant was liable, and gave judgment for the plaintiff for the amount claimed—hence the present appeal of the defendant.

Mr. Edgar Foà appeared for the appellant, and Mr. G. F. Hohler for the respondent.

The Master of the Rolls, without calling upon counsel for the respondent, in giving judgment, said that though they felt great sympathy with the defendant, the question they had to decide was whether or not the defendant was bound by his contract to accept this burden. He thought it had been clearly established that the word "outgoings" in the covenant covered this particular class of expenditure. The order to alter the system of drainage was, no doubt, a very drastic one, but, having regard to the condition of the premises at the time of the contract, it was impossible to say that it was outside the contemplation of the parties that the Sanitary Authority might not make such an order. It was impossible to say that it was unreasonable to suppose that the defendant undertook this responsibility in view of the fact that the plaintiff and the defendant had come to an agreement in perfectly clear and unambiguous terms, by which the tenant agreed to pay all "outgoings." His Lordship thought it would be straining the language if the Court acceded to the argument on behalf of the defendant.

The Lords Justices concurred, and the appeal was accordingly dismissed with costs.

ACTION TO ENFORCE A CHARGE OF PAVING EXPENSES.

THE case of the Mayor, etc., of West Bromwich *v.* Owen came before Mr. Justice Buckly in the Chancery Division on the 11th inst., an action by the plaintiffs against the defendant to enforce a charge for paving, etc., under the Public Health Act, 1875.

Mr. Buckmaster, K.C., and Mr. Guy Lushington were counsel for the plaintiffs; and Mr. Frank Dodd for the defendant.

Mr. Buckmaster, in opening the case, said each step in regard to the apportionment of the road had been complied with, and the plaintiffs had served the notices on the persons who were the owners of the property abutting thereon within the meaning of the Act.

His Lordship asked what the defence was.

Mr. Dodd said that the plaintiffs asked for a charge on the property. The defendant was only the owner of the equity of redemption. There were mortgagees, and they ought to have been served with notice by the plaintiffs. He submitted that under the 257th section of the Act all the notices had not been served.

Mr. Buckmaster said the facts of the case were these:—There were certain houses in a road called Poplar-avenue, Nos. 2 to 26, even numbers, and No. 55, Legg-street. The plans for making this road were deposited on March 26, 1896, with the local authority. On February 15, 1899, a notice was served on the then owner of this property, Mr. George Walker, requiring him to do certain work to the road, such as levelling, etc. The owner did not do the work, and the plaintiffs did it in default. On September 28, 1899, the works were completed, the total cost being 364*l.* On June 26, 1900, the amount was apportioned, and the amount apportioned in respect of the property in question was 128*l.* Notice of apportionment was given to the defendant on April 23, 1901, and as no dispute had arisen it was binding, and could not be disputed now. On November 28, 1901, a demand was made for payment, and this was now admitted. The only one thing further to prove was that when the plaintiffs served the notice of apportionment the defendant was the owner.

Mr. Dodd said that the defendant was not the owner on April 23, 1901.

His Lordship: What is the point?

Mr. Dodd: The point between us is whether the service on me is compliance with the Act, and whether it should not have been service on the owner at the time the works were completed.

Mr. Buckmaster said he wanted to have the defendant's interest in the property bound by the charge. He was in receipt of the rack-rent. He did not ask for a personal charge.

Mr. Dodd said the 257th section was the only section which gave the charge on the premises, and only applied in all cases where a local authority had incurred expenses in respect of which the owner was made liable under the Act. When they came to that the only section to be relied upon was the 150th, and the owner was not liable under that until he had made default. There must be a default by the person sued, and that was not the case here.

In the result, His Lordship made an order in favour of the plaintiffs in the usual form, declaring that there was a charge, and calling for an inquiry to see who the owners were. He ordered the defendant to pay the costs of the action, so far as they exceeded the costs that would have been incurred if an originating summons had been issued.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

2,065 of 1903.—H. H. OWEN and A. C. GOOD: *Boiler Heater and Fuel Economiser for use in Domestic and other Fireplaces and Furnaces.*

This invention consists of a bar of fireclay or other approved refractory material, which forms the upper part of a hot chamber, the sides or legs of such chamber being formed of two independent pieces of cast iron. The special feature of the article is, that by being moulded in the thickness of the material so that the aperture of the economiser is narrower in the front than the back portion, when placed in position in the firebox of range or furnace in front of a boiler, the recessed portion forms a hot air chamber, thereby intensifying the heat of the fire and increasing the rapidity of heating the water in the boiler with less consumption of fuel than would otherwise be the case.

2,080 of 1903.—J. P. GUY: *Edge-runner Grinding Mills or Mortar Mills, or other Grinding Mills.*

Edge-runner grinding mills or mortar mills, or the like grinding mills, consisting in the arrangement and combination therewith of a series of apertures in the side wall of the pan, and one or more auxiliary rollers and one or more spring scrapers adapted to act in conjunction with said perforated side wall of the pan on the material under treatment in said pan.

2,127 of 1903.—R. PALMER: *Tiles, Slabs, or Plates for Walls, Ceilings, and for use in the Construction and Decoration of Buildings generally.*

Tiles, slabs, or plates formed out of sheet metal, or other suitable material, and with one or both sides turned up to form a flange, or flanges, said flanges being perforated to form a locking device for mortar or cement.

2,421 of 1903.—A. H. MAURICE and H. G. J. BARROW: *Picks, Sockets, and Helves, and the Method of Attaching Sockets to Helves.*

This invention relates to a method of combining a movable pick head and a socket with a helve, the socket being attached to the helve without the use of pin, rivet, screw, or such like attachment.

5,216 of 1903.—J. GOODARE and J. B. GOODARE: *Locks.*

Locks and latches characterised by a spring actuated trigger bolt, which engages with and retains the ordinary bolt when drawn back, and has a projection through the face plate which, upon meeting the staple or catch plate, simultaneously releases the bolt, which then shoots into the staple.

5,383 of 1903.—G. HAYES: *Windows and Window Sashes and Frames.*

This consists in the combination of an outer fixed frame, shouldered at each side with an overlap along its sill, and a lengthwise overlap in or along the under face of its top rail; an inner frame, fitted swinging within the outer frame, and shouldered at each side in correspondence therewith, and having vertical lengthwise passages through its top and bottom rails, in correspondence with vertical grooves in its sides; a lower sash, fitted sliding in the front of said grooves of the inner frame, and adapted to pass beyond and through the bottom passage thereof to a junction with the overlapping sill of the outer frame, and an upper sash, fitted sliding in the rear side grooves of the inner frame, and adapted to pass beyond and upward through the top passage thereof to a junction with the overlap-provided top rail of the outer frame.

5,453 of 1903.—J. AYERS and A. T. AYERS: *Adjustable Sofa Ends, Chair Backs, and the like.*

A fitting for the purpose of holding the head or end of a settee, sofa, chair, or other article of furniture in any given position or at any required angle, consisting of one or more sliding bars, having ratchet teeth suitably cut on one edge, which are engaged by a detent lever held by a spring, which may be pivotted on and form part of another sliding bar.

5,594 of 1903.—H. H. LAKE (Chemisch-Technische Fabrik): *A Process for Colouring and Hardening Natural Stone, also applicable to Organic Material, such as Ivory, or the like.*

A process for colouring natural crystalline compact stones, especially natural marble or organic materials such as ivory, consisting in first freeing the stone or other material from air, then forcing colouring solutions by pressure therein, and finally evaporating the solvents.

5,611 of 1903.—A. GILES, F. C. GILES, and A. C. HOWELL: *Casement Stays and Window-blind Cord Rack Pulleys.*

A casement stay, the combination and employment with the stay proper of a gripping device, consisting essentially of a spring, made by bending a piece of strip or sheet metal, or other metal, to form two outwardly projecting spring limbs through holes in which the stay proper passes, said spring limbs being so shaped and arranged that when they are squeezed towards each other their angles with the stay become less acute, and the stay is free to slide through them, but when the limbs are released they spring apart and the stay is gripped in the holes in the limbs.

6,022 of 1903.—W. MOTTERSHALL: *Smoke Extracting Apparatus for Chimneys, applicable also for Ventilating.*

A smoke extracting apparatus, consisting of a horizontal tube forming part of, or attached to, or supported by or in, a vertical revolvable tube, the said horizontal tube being parallel or partly parallel and partly conical or doubly conical, and having located in the interior of one end a conical tube, open at one end to the outer atmosphere, and at the other end to the interior of the horizontal tube and a vane located on the horizontal tube.

6,465 of 1903.—R. HODGES and J. H. WATSON: *Indicating Bolts or Latches for Lavatories.*

Indicating bolts or latches for doors, consisting in the combination with a bolt or like part and a pivottal handle or finger piece of a cam, operated by the angular movement of the said handle or finger piece, and adapted to impart a sliding movement to the said bolt or like part.

7,232 of 1903.—A. SOWDEN (M. Sowden): *Apparatus for Humidifying Air.*

This invention relates to an apparatus designed for humidifying the atmosphere of weaving sheds, spinning sheds, and other rooms and buildings. The invention consists of a tube of woven material, which is saturated with water and then placed in such a position that a stream of air passes through, and the draught distributes the moisture. According to this invention, a tube or funnel is employed, made of cloth or woven textile fabric, which is lowered into a vat of water, or otherwise saturated, and then raised into position wherever required, and acting as a chimney or ventilator; a current of air, preferably from the outside of the building, passes through the tube, and the draught causes a dispersal of the moisture contained in the tube, the moisture being driven off in the form of a very fine spray, and thus ensures humidification.

10,733 of 1903.—W. G. BEHENNA: *A Safety Fire Curtain.*

The object of this invention is to provide a curtain to be attached to fire grates or mantelpieces for protection from fire. The curtain is fixed on a roller on the inside top part of the grate, the grate having a slot cut to allow the curtain to pass through and down a groove on each side of the grate. The curtain is fixed on a spring roller, which can be partially or fully lowered or raised as desired, and, being composed of non-inflammable material, when lowered prevents cinders or burning coals from falling on to the floor, thereby preventing all possibility of danger to the room from fire.

9,637 of 1903.—W. MAWLAM and S. R. HINGLEY: *Means for Suspending Sliding Window Sashes and the like.*

This invention is applicable to sliding windows and the like. In carrying out this invention a metallic bracket is used, with a spring and pulley attached, which is fastened to the sash frame, and the pulley rotates on to a metallic corrugated rack, which is fastened on the window frame. The sash frame can be raised and lowered, and will stop in any position required. The bracket or the rack can be fastened either to the sash frame or to the window frame, as the case may be.

22,264 of 1903.—B. COHEN AND SONS, LTD., and W. RUTTER: *Knock Down or Folding Furniture.*

According to this invention a series of fasteners is employed, provided with screw shanks and laterally projecting heads, the said fasteners being applied to one section of the furniture so that the heads are some little distance away from the surface thereof; in the adjacent part

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

of another section a recess is formed, which is covered by a metal plate having in it a slot into which the head of the fastener can be inserted in such manner that when the two parts are moved slightly relatively with each other the head thereon will engage with the metal plate and so form the necessary lock. In some cases the screwed shank is made of sufficient length to permit of the head, when the fastener is fixed to one part of the furniture, being passed entirely through a slot in the adjacent section, so that it projects beyond the surface thereof, the shank being then turned to place the head of the fastener out of coincidence with the slot.

26,350 of 1903.—J. COSSMANN: *Daylight Reflectors.*

A daylight reflector, comprising a plurality of reflecting plates revolvubly journalled above each other, and provided with pintles, bars adjustably secured to the sides of the bay of the window and provided with oblong slots for the reception of said pintles, fingers secured to one of the pintles of each reflecting plate, and means connecting said fingers for simultaneously rotating said reflecting plates.

751 of 1903.—J. B. DAVIES: *Nail or Screw for Securing Corrugated Iron.*

A nail or screw having a soft metal bearing part or surface under the solid head, secured by being made to overlap the periphery of the head when covering the head, and by fitting above projections on or into indentations formed in the shank of the plank nail, such projections being either left as existing before attachment of soft metal part, or forced upward during attachment of said soft metal part.

5,533 of 1903.—T. GREEN: *Apparatus for Washing and Cleansing Air or Smoke, also for General Ventilating Purposes, and for Disinfecting or Perfuming.*

An apparatus for ventilating, cleansing, disinfecting, and perfuming buildings, as also for washing smoke, consisting in the combination with the chamber of inlet and outlet pipes, the latter provided with disinfecting or perfuming means, an outer pan or chamber forming a water seal, horizontally disposed turbine and fan provided with pockets, and water jets provided with delivery nozzles for driving the turbine.

5,876 of 1903.—J. SMART: *Method of Asphalting Bridges, Viaducts, Roofs, Damp Courses, and the Manufacture of Slabs for such purpose.*

A method of asphalting bridges, viaducts, roofs, damp courses, and the like, consisting of first coating the ground or surface with asphalt and then applying sheets of perforated metal, covering same with asphalt, then covering with other sheets of perforated metal, and covering same with more asphalt, and the whole being amalgamated and bonded together when set.

5,917 of 1903.—A. FAULKES: *Paving Flooring and the like.*

A new device in pavement for streets, shops, warehouses, dwelling houses, stairs, and landings, composed of lime or cement concrete or mineral asphalt into which wood, stone, metal, asphalt, composite, or concrete blocks are inserted. The paving made up in separate blocks, or laid *in situ* over any area.

6,153 of 1903.—S. WRIGHT: *Blocks for the Erection of Fireproof Partitions.*

Blocks for the erection of fireproof partitions composed of plaster of Paris or Portland or other cements, with an admixture of cocoanut or coke breeze, stone ballast, granite, or other similar material, with a square sinking on each end.

6,596 of 1903.—R. MAIN: *Rolled Iron and Steel Joists or Girders.*

A girder of H section composed of two parts or sections, each rolled of T section, and having a half-check formed in the web in such wise that when the web parts are placed together they overlap, the said overlapping web parts being rivetted together so that the lines of rivetting are approximately along the neutral axis or mid-depth of the girder.

7,203 of 1903.—T. HILLMER: *Bore Hole Plummet or Deviation Recorder.*

A bore hole plummet comprising a cylinder adapted to be lowered into the bore hole to be examined, such cylinder having a plummet needle within its interior adapted to mark its position on a disc if a relative movement occurs between the needle point and the cylinder, or part thereof.

7,373 of 1903.—A. KENDRICK: *Devices for Making Branch Connexions to a Range of Pipes for Draining and other purposes.*

A device for facilitating the connexion of branch auxiliary pipes to a range of flanged pipes, consisting of a ring which is adapted to be interposed between two adjacent flanges in the range of pipes, and make fluid-tight joints therewith, such ring having a passage from the interior to the exterior, the external end of which is adapted to make fluid-tight connexion with a branch auxiliary pipe.

13,455 of 1903.—O. BERTAZZOLI and B. GAZZANO: *Securing or Fastening Sheets or Plates of Suitable Material over Surfaces such as Floors, Ships' Decks, Bridges, and the like, and Rivets therefor.*

In fastening together sheets or plates of suitable material over surfaces, particularly such as the metal bridges of ships, consisting in rivetting a covering strip or strips of such material, or rivetting the overlapping parts by means of rivets, the shanks of which are partly hollow, and are provided at the end opposite the head with a flared plug, which rests upon the surface to be covered, so that when the rivet is hammered the shank is caused to spread out in accordance with the profile of the plug, forming a rivetted joint.

26,910 of 1903.—F. A. HEADEON: *Pipe Cutting Tools.*

A pipe cutting tool, consisting in the combination of a frame portion provided with a jaw having a plurality of bearing points, a sliding block mounted on such frame provided with roller mechanism, a cutting tool provided with a cutting point mounted between the axial centre of such roller mechanism and the bearing points of the jaw, and means for moving such cutting tool independently of the sliding block and roller mechanism.

27,165 of 1903.—E. TIETZCH: *Locks, Bolts for Doors, and the like.*

A bolt for house doors and the like, characterised by its being shot back by the key on opening the door, and on closing the door shoots automatically into place.

27,588 of 1903.—E. G. ABELL: *Holder for Window Sashes.*

A window holder consisting in the combination with a pair of window sashes and jambs, of a holder pivotted to the jamb centrally or above or below the meeting rails of said sashes, and having pivot eye or loop ends to suit similar eye plates or pins or bolts affixed to styles of top and bottom sashes.

27,784 of 1903.—R. M. SOMERS: *Boilers for Kitchen Ranges.*

A boiler for kitchen ranges, composed of a main boiler permanently set with the range, and an auxiliary boiler placed at the front of the main boiler and removably connected therewith.

27,928 of 1903.—N. FARNHAM: *Waterproofing of Bricks, Stone, and the like Porous Materials.*

A method of waterproofing and finishing the surface of stone, brick, and other porous material by heating the porous material, and, while heated, applying a waterproof compound to the heated surface and subsequently hardening the surplus of the compound and removing it from the surface by a blast of sand and air.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 2.—By HY. SPENCER & SONS (at Gainsborough).

Hemswell, Lincs.—Freehold house and 1 a. 1 r. 21 p.	£421
Three freehold closes, 8 a. 0 r. 7 p.	507
Snitterby, Lincs.—Freehold farm buildings and 28 a. 3 r. 19 p.	1,000

February 4.—By NORMAN & SON (at Uxbridge).

Hillingdon, Middx.—Villier-st., "The Canteen" b.h., f., y.r. 36*l*	925
2 to 13, Villier-st., f., y r. 162*l*.	1,475
Colham Green, 13 freehold cottages, w.r. 149*l*. 10s.	1,400
Pole-hill, three freehold building plots	350
Uxbridge, Middx.—10 to 14, Bennett's-yd., f., w.r. 61*l*. 2s.	645
1, 2, and 3, Crown and Sceptre-yd., f., w.r. 23*l*. 8s.	130
Bridge-rd., a freehold building plot	180

February 6.—By WILLSON & PHILLIPS (at Southend).

Westcliff-on-Sea, Essex. — Sea View estate, main-rd., a freehold house and shop, y.r. 30*l*.	400

February 8.—NIGHTINGALE, PHILLIPS & PAGE.

Fulham.—Waterford-rd.,f.g. rents 18*l*., reversion in 55½ yrs.	520
Surbiton.—4, Brighton-rd. (8), f., y.r. 35*l*.	510
Twickenham.—21 and 23, Orleans-rd., f., w.r. 33*l*. 16s.	335

By IZARD & IZARD.

St. George's East.—74, 75 and 76, St. George-st. (8), with yards and workshops, part freehold and part u.t. 44 yrs., g.r. 25*l*., e.r. 286*l*.	2,250

February 9.—By SIMMONDS & MOORE (at Richmond).

Teddington.—11, Cambridge-rd., u.t. 965 yrs., g.r. 6*l*., e.r. 42*l*.	360

February 10.—By BAXTER, PAYNE & LEPPER.

West Wickham, Kent.— Grosvenor-rd., f.g. rents 60*l*., reversion in 77 yrs.	1,400

By MULLET, BOOKER & CO.

Hyde Park.—147, Gloucester-ter., u.t. 38¼ yrs., g.r. 18*l*., p.	1,310

By THURGOOD & MARTIN.

Hanover Square.—18, George-st. (8), area 1,536 ft., f., y.r. 260*l*.	11,100
Hackney.— Blackstone-rd., f.g. rents 30*l*., reversion in 43½ yrs.	820
Westbourne Park.—Aldridge-rd. villas, f.g. rents 81*l*., u.t. 52½ yrs., g.r. nil.	1,620

By DOUGLAS YOUNG & CO.

South Lambeth.—219, South Lambeth-rd., u.t. 61½ yrs., g.r. 12*l*., e.r. 65*l*.	700
Clapham. — Triangle-pl., f.g. rents 21*l*., reversion in 43 yrs.	550
Battersea.—38, Comyn-rd., u.t. 80 yrs., g.r. 8*l*. 8s., y.r. 45*l*.	450
Wandsworth.—32 and 34, Atheldene-rd., u.t. 93 yrs., g.r. 11*l*., w.r. 67*l*. 12s.	400
Brockley.—71, Brockley-rd. (8), u.t. 60 yrs., g.r. 5*l*., y.r. 40*l*.	380

February 11.—By CHESTERTON & SONS.

Kensington.—4, Cluny-mews, u.t. 71½ yrs., g.r. 8*l*., y.r. 45*l*.	450

By WHEELER & SON.

Ealing.—8, St. Leonard's-rd., u.t. 83 yrs., g.r. 10*l*., p.	755

By THOMAS SHARP.

East Ham.—11, 13, 41, 63, 71, 73, 75 and 77, Compton-av., f., w.r. 223*l*. 12s.	2,040
43, 53, and 57, Barking-rd. (8), f., y.r. 155*l*.	1,845

By STIMSON & SONS.

Old Kent Road.—No. 519, f., y.r. 34*l*.	700
Camberwell.—17, Caspian-st., f., w.r. 36*l*. 8s.	400
Catford.—Scrooby-st., f.g.r. 22*l*., reversion in 83¼ yrs.	495
Hackney.—Southborough-rd., f.g. rents 20*l*. 5s., u.t. 38½ yrs., g.r. 4*l*.	250
Clapham.—53, Fentiman-rd., u.t. 24½ yrs., g.r. 7*l*. 10s., e.r. 48*l*.	250
Brixton.—84, 86, 94, 96, 98, 102, and 104, Dalberg-rd., u.t. 70 yrs., g.r. 46*l*. 7s., y.r. 255*l*.	2,390
Lambeth.—17 to 27 (odd), Stangate-st., u.t. 39½ yrs., g.r. nil, y.r. 222*l*. 14s.	1,890
56, Oakley-st., f., w.r. 46*l*. 16s.	450
Bermondsey.—Grange-rd., f.g.r. 6*l*., reversion in 21 yrs.	350
Camberwell.—Waterloo-st., f.g.r. 6*l*. 6s., reversion in 68½ yrs.	165

By EDWIN EVANS (at Battersea).

Wandsworth.—47 to 75 (odd), and 79, Trentham-st.; and 35, Lonsdale-ter., u.t. 96½ yrs., g.r. 89*l*. 5s., w.r. 530*l*. 8s. (in one lot)	3,255
5, Hugon-rd., u.t. 75 yrs., g.r. 4*l*., w.r. 28*l*. 12s.	240
9 and 11, Chatto-rd., u.t. 80 yrs., g.r. 12*l*., w.r. 76*l*. 14s.	610
Battersea.—5, 7 and 9, Currie-rd., u.t. 70 yrs., g.r. 12*l*. 12s., w.r. 101*l*. 8s.	750
89, Harbut-rd., u.t. 75 yrs., g.r. 6*l*. 15s., w.r. 44*l*. 4s.	395
126, Usk-rd., u.t. 47½ yrs., g.r. 2*l*., w.r. 23*l*. 8s.	160
21 to 27 (odd), Savona-st., u.t. 31 yrs., g.r. 8*l*., w.r. 106*l*. 12s.	395
69, Wye-st., f., w.r. 33*l*. 16s.	295
Clapham.—76, North-st., u.t. 66½ yrs., g.r. 5*l*. 12s. 6d., e.r. 36*l*.	343
Kensington.—8, Bolingbrooke-rd., u.t. 82 yrs., g.r. 12*l*., y.r. 50*l*.	550

By ROBERT NEWMAN (at Uxbridge).

Sipson, Middx.—Harlington-rd., "Hollycroft" and 2¼ acres, f., y.r. 70*l*.	1,200
Harlington-rd., freehold fruit plantation, 7 a. 0 r. 5 p., y.r. 75*l*.	1,555
Chitterfield-gate, "Scroogeall" fruit plantation, 2 a. 2 r. 36 p., f., y.r. 30*l*.	780
Chitterfield Gate, market garden and fruit land, 4 a. 2 r. 16 p., f., y.r. 25*l*.	235
Harmondsworth, Middx.—Heathrow, freehold fruit plantation, 9 a. 3 r. 4 p., y.r. 40*l*.	720

February 12.—By W. A. BLAKEMORE.

Ealing. — Windmill-la., a freehold building estate, area 5 acres	3,000

By G. A. WILKINSON & SON.

New Bond Street.—11, Conduit-st. (8), area 2,335 ft., corporation lease, g.r. 25*l*. 1s. 1½d., y.r. 520*l*.	14,000
Southwark.—29, 30 and 31, Emerson-st., f., w.r. 109*l*. 4s.	1,220
Westminster.—31, 32 and 33, Medway-st., f., w.r. 98*l*. 16s.	1,450
Kensington.—112, North End-rd. (8), 1 to 4, Ebenezer-cottages, and land adjoining, area 13,000 ft., f., y.r. 166*l*. 12s.	2,850
Fulham.—112a, 114 to 126 (even), North End-rd., f., w.r. 232*l*. 14s.	4,380
126, North End-rd. (8), f., y.r. 60*l*.	1,210
130 to 136 (even), North End-rd. (8), c., y.r. 202*l*.	2,545
Lanfrey-pl. yd., workshop, &c., f., p.	170
Lanfrey-pl. stabling and coach-house, c., w.r. 28*l*. 12s.	225
1 to 23 (odd), Lanfrey-pl., c., w.r. 254*l*. 16s.	2,695
2 to 12 (even), Lanfrey-pl., f., w.r. 153*l*. 8s.	1,815
35, Lanfrey-pl., c., w.r. 23*l*. 8s.	260
Kensington.—39 and 41, North End-rd. (8), c., y.r. 115*l*.	1,970
43 and 45, North End-rd., c., y.r. 95*l*.	1,870
4 to 16 (even), Portland-st., c., y.r. 235*l*. 15s.	2,190
Notting Hill.—1, 3 and 5, Latimer-rd., f., w.r. 81*l*. 18s.	755
7 and 9, Latimer-rd. (8), f., w.r. 59*l*. 16s.	560

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. or leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; e. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

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MEETINGS.

FRIDAY, FEBRUARY 19.

Architectural Association.—Mr. W. H. White on "Corner Houses." 7.30 p.m.

Institution of Mechanical Engineers.—Fifty-Seventh Annual General Meeting. The annual report of the council will be presented, and the results of the ballot for the annual election of the president, vice-presidents, and members of council will be announced. The discussion on "Heat Treatment of Steel" will then be continued and concluded, after which a paper on "The Motion of Gases in Pipes, and the Use of Gauges to Determine the Delivery," will be read by Mr. Richard Threlfall, F.R.S., of Birmingham. 8 p.m.

Royal Institution.—Mr. H. Brereton Baker, M.A., F.R.S., on "Some Unexplained Experiments," illustrated. 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. R. Dudfield on "Duties of a Sanitary Inspector: Indoor." 7 p.m.

SATURDAY, FEBRUARY 20.

Architectural Association.—Third Spring Visit to Holy Trinity Church, Prince Consort-road, Kensington Gore (back of Royal Albert Hall), by permission of Mr. G. F. Bodley, R.A. Members to meet at the church at 2.30 p.m. A visit will afterwards be paid to the Royal College of Science, Kensington, by permission of Mr. Aston Webb, R.A.

Royal Institution.—Right Hon. Lord Rayleigh on "The Life and Work of Stokes," I. 3 p.m.

Junior Institution of Engineers.—Visit to the Colonial Consignment and Distributing Company's Frozen Australasian Meat Store, Nelson's Wharf, Commercial-road, Lambeth, under the guidance of Mr. C. S. T. Molecey, A.M.I.C.E., Chief Engineer. 2 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at a house in Stoke Newington. 3 p.m.

Association of Managers of Sewage Disposal Works (Meeting at Westminster Hotel, New York-street, Leeds).—Mr. J. Ashton on "The Disposal and Utilisation of Sewage Sludge." 3 p.m.

MONDAY, FEBRUARY 22.

Surveyors' Institution.—Mr. J. H. Elwes, F.R.S., on "British Timber and its Uses." 8 p.m.

Incorporated Clerks of Works' Association.—Twenty-first Annual Dinner, Holborn Restaurant (King's Hall). 6.15 p.m.

Regent-street Polytechnic (University Extension Lectures).—Professor Vivian B. Lewes on "The Chemistry of Air, Fire, and Water," IV. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. R. Dudfield, M.A., on "Duties of a Sanitary Inspector: Offensive Trades and Trade Nuisances, etc." 7 p.m.

Glasgow Philosophical Society.—Paper by Mr. R. Scott. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Charles T. Jacobi on "Modern Book Printing." 8 p.m.

TUESDAY, FEBRUARY 23.

Sanitary Institute (Demonstration for Sanitary Officers).—Demonstration of Bookkeeping as Carried out in a Sanitary Inspector's Office, at the Public Health Office, Town Hall, Upper-street, Islington, N., by Mr. J. R. Leggatt. 7 p.m.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. A. Alban H. Scott on "Quantities and Measurements of Sanitary Works." 7 p.m.

Institution of Civil Engineers.—(1). Mr. J. Denis Twinberrow on "The Construction of Railway-Wagons in Steel." (2). Mr. A. L. Shackleford on "The Construction of Iron and Steel Railway-Wagons." (3). Mr. J. T. Jepson on "Iron and Steel Railway-Wagons of High Capacity." 8 p.m.

WEDNESDAY, FEBRUARY 24.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1). Inspection in the District of Islington. 2 p.m. (2). Dr. A. Wellesley Harris on "Infectious Diseases." 7 p.m.

Northern Architectural Association.—Mr. Ralph Hedley on "Architectural Details in Charcoal." 7.30 p.m.

Society of Arts.—Mr. F. Tiffany on "Mahogany and Other Fancy Woods Available for Constructive and Decorative Purposes." 8 p.m.

Institution of Civil Engineers (Students' Visit).—To Inspect the Reinforced Concrete Pier in Course of Construction at Purfleet. Train from Fenchurch-street Station to Purfleet, 1.48 p.m.

THURSDAY, FEBRUARY 25.

Royal Institution.—Professor H. L. Callendar on "Electrical Methods of Measuring Temperature," I. 5 p.m.

Carpenters' Hall, London-wall (Free Lectures on Matters Connected with Building).—Professor W. Schlich on "The Forestry Problem in the United Kingdom." 8 p.m.

Institution of Electrical Engineers.—Adjourned discussion on Paper on "Trans-Atlantic Engineering Schools and Engineering," by Dr. R. M. Walmsley. 8 p.m.

London Master Builders' Association.—Annual General Meeting. 4 p.m.

Leeds and Yorkshire Architectural Society.—Mr. W. H. Bidlake on "The Romanesque Churches of Auvergne." 6.30 p.m.

FRIDAY, FEBRUARY 26.

Royal Institution.—Mr. Alexander Siemens on "New Developments in Electric Railways." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Wellesley Harris on "Methods of Disinfection." 7 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. Colin Sinclair on "Floor Paving: Wood, Granolithic, Asphalte." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. L. G. Crawford on "Boiler-House Design." 8 p.m.

SATURDAY, FEBRUARY, 27.

Royal Institution.—Rt. Hon. Lord Rayleigh on "The Life and Work of Stokes," II. 3 p.m.

Sanitary Institute (Demonstration for Sanitary Officers).—Inspection at Tottenham Disinfecting Station and Dust Destructor. 3 p.m.

WEDNESDAY, MARCH 2.

Institute of Sanitary Engineers, Ltd.—Mr. Chilvers on "W.C.'s in General." 7 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.	
Hard Stocks	1	16	0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1	13	0	" " "
Facing Stocks	2	12	0	" " "
Shippers	2	10	0	" " "
Flettons	1	10	0	" a railway depôt
Red wire Cuts	1	13	0	" " "
Best Fareham Red	3	12	0	" " "
Best Red Pressed Ruabon Facing	5	0	0	" " "
Best Blue Pressed Staffordshire	4	4	0	" " "
Do. Bullnose	4	10	0	" " "
Best Stourbridge Fire Bricks	4	8	0	" " "
GLAZED BRICKS. Best White and Ivory Glazed Stretchers	13	0	0	" " "
Headers	12	0	0	" " "
Quoins, Bullnose, and Flats	17	0	0	" " "
Double Stretchers	19	0	0	" " "
Double Headers	16	0	0	" " "
One Side and two Ends	19	0	0	" " "
Two Sides and one End	20	0	0	" " "
Splays, Chamfered, Squints	20	0	0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	" " "
Quoins, Bullnose, and Flats	14	0	0	" " "
Double Stretchers	15	0	0	" " "
Double Headers	14	0	0	" " "
One Side and two Ends	15	0	0	" " "
Two Sides and one End	15	0	0	" " "
Splays, Chamfered, Squints	14	0	0	" " "
Second Quality White and Dipped Salt Glazed	2	0	0	" less than best.

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	" "
Best Portland Cement	29	0	per ton, "
Best Ground Blue Lias Lime	20	6	"

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. 6d.	per yard, delivered.
Stourbridge Fire Clay in sacks	27s. 6d.	per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1	8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	2½	" "

	s.	d.	
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt.
Beer in blocks	1	6	" "
Greenshill "	1	10	" "
Darley Dale in blocks	2	4	" "
Red Corsehill "	2	5	" "
Closeburn Red Freestone	2	0	" "
Red Mansfield "	2	4	" "

YORK STONE—*Robin Hood Quality.*

	s.	d.	
Scappled random blocks	2	10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot super. "
6 in. rubbed two sides ditto, ditto	2	6	" "
3 in. sawn two sides slabs (random sizes)	0	11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	" "
1½ in. to 2 in. ditto, ditto	0	6	" "

STONE—(*continued*)—

	s.	d.	
HARD YORK— Scappled random blocks	3	0	per ft. cube rly. depot.
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super. "
6 in. rubbed two sides Ditto	3	0	" "
3 in. sawn two sides slabs (random sizes)	1	2	" "
2 in. self-faced random flags	0	5	" "

Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld rly. depôts.
" 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depot.
" 3 in do.	1	2½	" "

SLATES.

in.	in.	£	s.	d.	
20 × 10	best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20 × 12	" "	13	17	6	" "
20 × 10	best seconds "	12	15	0	" "
20 × 12	" " "	13	10	0	" "
16 × 8	" " "	7	0	0	"
20 × 10	best blue Portmadoc	12	12	6	" "
16 × 8	best blue Portmadoc	6	12	6	per 1000 of 1200 at r. d.
20 × 10	best Eureka unfading green	15	2	6	" "
20 × 12	best Eureka unfading green	17	2	6	" "
18 × 10	" "	12	10	0	" "
16 × 8	" "	10	5	0	" "
20 × 10	permanent green	11	10	0	" "
18 × 10	" "	9	10	0	" "
16 × 8	" "	6	10	0	" "

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depot.
Hip and Valley tiles	3	7	per doz. " "
Best Broseley tiles	50	0	per 1000 " "
Do. Ornamental tiles	52	6	" " "
Hip and Valley tiles	4	0	per doz. " "
Best Ruabon red, brown or brindled do. (Edwards)	57	6	per 1000 " "
Do. Ornamental do.	60	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 " "
Do. Ornamental do.	54	6	" " "
Hip tiles	4	1	per doz. " "
Valley tiles	3	8	" " "
Best "Rosemary" brand plain tiles	48	0	per 1000 " "
Best Ornamental tiles	50	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	8	" " "
Best "Hartshill" brand plain tiles, sand faced.	50	0	per 1000 " "
Do. pressed	47	6	" " "
Do. ornamental, do.	50	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	6	" " "

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15	10	0	16	10	0
Deals: best 3 by 9	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	" "		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0	10	0	more than battens.		
½ in.	1	0	0	"		

	At per load of 50 ft.					
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0

JOINERS' WOOD.

	At per standard.					
White Sea: first yellow deals, 3 in. by 11 in.	23	0	0	24	0	0
3 in. by 9 in.	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
3 in by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Petersburg: second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14	10	0	15	10	0
3 in. by 9 in.	13	10	0	14	10	0
" "	11	0	0	12	0	0
Battens	13	10	0	14	10	0
Second white deals, 3 in. by 11 in	12	10	0	13	10	0
" " 3 in. by 9 in.	9	10	0	10	10	0
" " battens	16	0	0	18	0	0
Pitch-pine: deals	0	10	0	1	0	0
Under 2 in. thick extra	33	0	0	upwards.		
Yellow Pine—First, regular sizes	22	0	0	24	0	0
Oddments	24	10	0	26	10	0
Seconds, regular sizes	20	0	0	22	0	0
Yellow Pine oddments	0	3	6	0	4	6
Kauri Pine—Planks, per ft. cube	0	2	6	0	3	6
Danzig and Stettin Oak Logs— Large, per ft. cube	0	2	3	0	2	6
Small " "						

WOOD—(*continued*)—

JOINERS' WOOD.—(*Contd.*)	At per standard. £ s. d.	£ s. d.
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
½ in. do. do.	0 0 5½	—
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 1 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Flitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	7 10 0 ..	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0 ..	8 10 0
Staffordshire "Marked Bars"	10 10 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
" " galvanised	17 10 0 ..	—

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ..	—
" " 24 g.	10 15 0 ..	—
" " 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
" 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ..	—
" " 22 g. and 24 g.	16 10 0 ..	—
" " 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g	12 15 0 ..	—
" " 22 g. and 24 g.	13 5 0 ..	—
" " 26 g.	14 0 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
" " 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in.	9 5 0 ..	9 15 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 5 0 ..	—
Pipe in coils	14 15 0 ..	—
Soil pipe	17 5 0 ..	—
Compo pipe	17 5 0 ..	—
ZINC—Sheet—		
Vielle Montagne ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER—		
Strong Sheet per lb.	0 0 10½ ..	—
Thin "	0 0 11½ ..	—
Copper nails "	0 0 11 ..	—
BRASS—		
Strong Sheet per lb.	0 0 10 ..	—
Thin " "	0 0 11 ..	—
TIN—English Ingots "	0 1 5 ..	—
SOLDER—Plumbers' "	0 0 6½ ..	—
Tinmen's "	0 0 8 ..	—
Plowpipe "	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft.	delivered
" fourths	1½d.	" "
21 oz. thirds	3d.	" "
" fourths	2½d.	" "
26 oz. thirds	3½d.	" "
" fourths	3d.	" "
32 oz. thirds	4½d.	" "
" fourths	4d.	" "
Fluted sheet, 15 oz.	2½d.	" "
" 21 oz.	3½d.	" "
½ Hartley's Rolled Plate	1½d.	" "
⅝ " " "	2d.	" "
¾ " " "	2½d.	" "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 8
" " in drums	"	0 1 11
Boiled " in pipes or barrels	"	0 1 11
" " in drums	"	0 2 2
Turpentine, in barrels	"	0 3 10
" in drums	"	0 4 0
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	"	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

T. E. R. (Below our limit).

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* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDEEN.—For drainage of the east-end of Point Law, for the Aberdeen Harbour Commissioners. Mr. R. Gordon Nicol, Harbour Engineer, Aberdeen:—

Roderick McKay, 2, Abergeldie-road, Aberdeen	£383 9 3

ABERYSTWYTH.—For arcade and concert hall, Terrace-road, for Mr. D. Phillips. Mr. J. Arthur Jones, architect, 7, Queen's-terrace, Aberystwith:—

Lewis Bearne	£7,995	J. P. Lewis	£6,280
Owen Bros.	7,277	Edwards Bros.	6,150
David Williams	6,896	Edward E. Jenkins, Aberystwyth*	6,000
Edward Evans	6,800		
W. & J. Jones	6,538		

ACLE (Norfolk).—For partial restoration of nave, roof, and other work, Church of St. Edmund, Acle. Mr. H. J. Green, architect, 31, Castle-meadow, Norwich:—

E. G. Bland	£905 0 0	R. Chapman	£560 0 0
Graveling & Sewell	853 15 2	R. W. Riches	511 0 0
W. E. Jones	626 6 6	J. S. Smith	505 0 0
Downing Bros.	597 0 0	Chaston & Grimson	479 0 0
T. Gill	573 0 0		

ALNWICK.—For the erection of workmen's dwellings (in two blocks), for the Alnwick Council. Mr. J. Wightman Douglas, architect, 1, St. Nicholas'-buildings, Newcastle-on-Tyne, and 40, Bondgate Without, Alnwick:—

Tully & Sons	£16,344 11 8	Muckle Bros	£13,115 8 7
G. Bain	14,967 13 5	Green Bros.	12,720 0 0
Porteus	13,870 0 0	W. Dunn	12,471 1 0
McNeil	13,844 0 0	E. & T. George	12,378 13 1
Fordy	13,582 11 9	J. C. Mather	11,801 0 0
Davidson & Sons	13,368 15 0	Elliott Bros., Chathill*	11,685 0 0
R. M. Gibson	13,216 5 4		

[Architect's estimate, £11,880.]

ASHTON-UNDER-LYNE.—For boundary wall, etc., George Mellor-road, Union Infirmary, for the Guardians. Messrs. Eaton, Sons, & Cantrell, architects, Stamford-street, Ashton-under-Lyne:—

James Lidyard, Railway Saw Mills, Ashton-under-Lyne	£1,360 10 0

ASHTON-UNDER-LYNE.—For heating system at Nurses' Home, connected with Union Hospital, for the Guardians. Messrs. J. Eaton, Sons, & Cantrell, architects, Stamford-street:—

Saunders & Taylor, Lower Moseley-street, Manchester	£189 10 0

BEDFORD.—For additions to schools, for the Education Committee. Mr. H. Young, architect, Maitland-street, Midland-road, Bedford. Quantities by architect:—

C. E. Haynes	£1,962	Corby & Son	£1,802
Litchfield & Son	1,950	Melcombe Bros.	1,763
Brown & Son	1,906	E. Dawes	1,745
R. Jeakings	1,876	Warton & Dunstall	1,708
G. Harrison	1,873	Mann & Son	1,700
E. Casbeard	1,869	C. Kilpin	1,683
J. Potter	1,866	S. Foster, Kempston, Beds.*†	1,672
A. Ibbott	1,846	A. E. Pryer	1,537
C. Negus	1,845		

†Accepted subject to the approval of the Education Department.

BLAIRGOWRIE (N.B.)—Accepted for the erection of an auction mart, for Messrs. M'Kinnon & Doeg. Mr. W. J. Brewster Grant, architect, Bengarth, Blairgowrie:—

Excavator, Mason, and Brickwork: W. & C. Duncan, Murthley	All per schedule to cost £3,000.
Carpenter, Joiner, and Glazier Work: W. T. Robertson, Blairgowrie	
Slater Work: A. R. Duncan & Son, Rattray	
Plumber Work: Robt. Kidd, Blairgowrie	
Plaster and Concrete: Peter Donaldson, Coupar Angus	
Ironwork: J. S. Fraser & Son, Rattray	
Erection of Pens: W. Falconer, Rosemount	

BRIDLINGTON.—For erection of a house and shop, Clough Bridge, for Messrs. Spencer & Son. Mr. A. T. Martindale, architect, 66, Wellington-road, Bridlington:—

T. Wood	£569 0	T. Spink	440 0
E. Corne	545 0	F. Kneeshaw	438 0
J. Rennard	510 5	E. Wilson	432 1
H. Hoggard	492 9	Sampson & Siddall, Bridlington*	431 11
J. H. Hudson	479 10	G. Storr & Son (iron not included)	415 0
A. A. Booth	461 0		
Smallwood & Shaw	452 0		
J. Stork	449 0		

BRIDLINGTON.—For the erection of shops on Clough Bridge, Bridlington, for Messrs. Chambers & Bielly. Messrs. Brodrick, Lowther, & Walker, architects Central-chambers, Bridlington:—

	For Mr. Bielly.	For Mr. Chambers.
Booth	£654 0 0	£660 0 0
Spink	653 14 0	673 14 0
Wilson	636 0 0	623 17 0
Smallwood & Shaw	635 2 9	624 16 9
Hudson	612 8 0	637 10 0
Kneeshaw	604 14 6	618 6 0
E. Corner, New Burlington-road, Bridlington*	582 15 0	593 12 0
Rennard†	450 0 0	469 10 0

‡ Withdrawn.

BRIDLINGTON.—For the supply of 3,500 tons of whinstone and 1,000 tons of slag, for the Rural District Council of Bridlington. Mr. John Haggitt, Surveyor to the Rural Council:—

	Tons.	Price. s. d.
Whinstone, Machine Broken.		
Ord & Maddison, Darlington*	1,500	11 0
R. Summerson & Co., Cockfield, Durham*	1,000	11 0
Bradley Bros., Ltd., Great Ayton, Yorks.*	500	11 0
Wm. Schofield, Grosmont, Whitley*	500	9 6
Slag, Machine Broken, Ironstone.		
W. C. Clark, Darlington*	300	7 3
Slag, Machine Broken, Annealed.		
G. Hodsman, York*	250	7 9
Gladstone & Co., Grosmont, Whitley*	250	6 6
Wm. Schofield, Grosmont, Whitley*	250	6 6

BUCKHURST HILL (Essex).—For making-up roads, Palace-gardens, part of The Drive, and Powell-road, for the Urban District Council. Mr. H. Tooley, Surveyor:—

	The Drive.	Powell-road.	Palace-gdns.
T. Adams	£359 0 0	£497 0 0	£720 0 0
J. Ball	435 11 9	613 17 7	872 2 6
W. & C. French, Buckhurst Hill*	327 17 1	467 2 7	686 3 8
Grounds & Newton	406 11 9	579 10 8	874 19 5
Harvey Bros.	300 15 6	370 10 5	619 15 3
G. Lamble	298 0 0	429 0 0	718 0 0
Parson & Parsons	365 10 11	521 7 7	772 16 8
D. H. Porter	297 0 0	427 0 0	669 0 0
C. Summerfield	533 16 2	755 3 10	1,141 16 11
Surveyor's esti.	361 10 6	510 3 8	718 5 9

CAMELSDALE (Sussex).—For the erection of a new school in Camelsdale, near Haslemere, for the West Sussex Education Committee. Mr. J. H. Howard, architect, Lower-street, Haslemere:—

D. Fry	£1,530	L. M. Thompson	£1,220
F. Milton	1,296	W. Rollason	1,195
J. W. Humphreys	1,290	W. Harding	1,150
C. Baker	1,267	Mitchell Bros., Shalford, Guildford	1,132
Haslemere Builders	1,240		

CARDIFF.—For paving, kerbing, and channelling the footways, and forming and metalling the carriageways, of Pentyrch-street, Cwmdare-street, etc., for the Corporation. Mr. W. Harpur, M.Inst.C.E., Borough Engineer, Cardiff. Quantities by Borough Engineer:—

	C. Davies, Cardiff.	E. Osmond & Sons, Cardiff.	T. R. Williams, Cardiff*
Pentyrch-street	£229 4 2	£220 5 3	£207 17 2
Cwmdare-street	551 1 9	533 15 6	505 16 8
Brithdir-street	220 5 7	213 18 8	202 11 11
Lisvane-street	222 10 3	216 9 11	204 16 3
Rhygoes-street	382 18 4	363 16 4	343 8 11
Gelligaer-street	174 18 4	169 10 11	159 15 5
Cwmdare-lane	65 19 7	65 17 8	62 4 7
Brithdir-lane	54 12 1	54 2 2	51 9 4

CWMYSTWYTH.—For master's house, for the Llanfihangel-y-Croyddin Upper School Board. Mr. J. A. Jones, architect, 7, Queen's-terrace, Aberystwyth:—

Henry Wright	£450	Elias Ishmael, Pontrhydygroes*	£350
Lewis Davies	352		

DARTFORD.—For new ward, laundry, and additions to staff quarters, Bow Arrow-lane, for the Dartford Joint Hospital Committee. Mr. R. Marchant, architect, 28, Theobald's-road, W.C. Quantities by Messrs. J. S. Paul & Son, 31, Bedford-row, W.C. :—

T. Knight†	£9,360	Nightingale	£8,380
West & Sons	9,275	Enness Bros.	8,096
Scott & Branton†	9,106	A. Faulks	7,999
Multon & Wallis	8,982	Pearless, Dennis, & Co.	7,950
J. Lonsdale	8,957	Ellingham & Sons	7,877
Spencer & Sons	8,563	W. F. Blay, Dartford*	7,636
J. Ferguson & Co.	8,560		
Terry Building Co.	8,417		

DRIGHLINGTON.—For the erection of a branch store, for the Co-operative Society, Ltd. Mr. T. A. Turpin, architect. Quantities by architect :—

Masons' Work : S. and D. Thornton, Drighlington, near Bradford, Yorks.	£570	0	0
Joiners' Work : J. E. Grayshon, Adwalton, near Bradford	150	0	0
Slaters' Work : J. M. Thornton & Son, Heckmondwike, Yorks	24	18	0
Plumbers' Work : Alf. Cooper, Drighlington	13	18	0

EDINBURGH.—For the reconstruction of tenements, Nos. 20 to 25, Greenside-row, for the Magistrates and Council. Mr. James Massie, Burgh Engineer. Quantities by Mr. Alexander B. M. Smith :—

Mason : Scott & Brown, Barclay-place, Edinburgh	£1,057	6	7
Joiner : Jas. Duncan & Son, Grove-street, Edinburgh	615	0	0
Smith : P. Bell & Son, Pitt-street, Edinburgh	91	5	0
Slater : Jas. Duncan & Son, Buccleuch-street, Edinburgh	80	17	0
Plumber : D. Blake & Co., Beaverhall-road, Edinburgh	225	0	0
Plasterer : John Findlay, South Fort-street, Leith	240	0	0
Painter : P. & J. Gordon, Leithwalk, Edinburgh	49	10	0
Glazier : Coutts & Co., Lochrin-place, Edinburgh	11	12	0

GREAT YARMOUTH.—For Carnegie gift extension to the Free Library, for the Free Library Committee. Mr. J. W. Cockrill, A.R.I.B.A., Borough Surveyor, Town Hall, Great Yarmouth :—

Carter & Wright, Great Yarmouth* £4,790

HASTINGS.—For building and drainage work at workhouse infirmary, Ore, for the Guardians. Messrs. A. W. Jeffery & Son, architects, 5, Havelock-road, Hastings :—

Piper	£1,325	Roffe	£1,195
Leonar	1,277	Snow	1,151
A. Cruttenden	1,249	Adams	1,123
T. King	1,225	H. E. Cruttenden	1,092
Padgham & Hutchinson	1,219	Lamb	1,021
Cramp	1,214	Paulson	1,010
Harvey	1,197	Ditch	1,007

[All of Hastings].

KING'S LYNN.—For new public library. Mr. H. J. Green, architect, 31, Castle-meadow, Norwich :—

Read & Wildbur	£4,360	Tash, Langley, & Co.	£4,150
J. Medwell	4,340	R. Dye	4,072
Bardell Bros.	4,298	A. F. Foreman	3,887
		W. F. Smith	3,827

KINGSWINFORD.—For 1,155 tons of c.i. pipes (contract No. 3), for the Rural District Council. Mr. W. Fiddian, Engineer, Old Bank Offices, Stourbridge :—

Nine tenders from £6,703 12s. 11d. downwards were received. Messrs. David Parsons & Sons, Brierley Hill, accepted at £5,363 17s. 8d.

KINGSWINFORD.—For manholes and lamphole covers, etc. (contract No. 2), for the Rural District Council. Mr. W. Fiddian, Engineer, Stourbridge :—

Thirty-nine tenders from £1,760 14s. downwards were received. Mr. George Glaze, of Pensnett, near Dudley, accepted at £796 9s. 7d.

KINGSWINFORD.—For distributing carriers, effluent drains, road making, and additions to farmhouse and buildings, for the Rural District Council. Mr. W. Fiddian, Engineer to the Council, Stourbridge :—

Eleven tenders from £7,955 12s. 1d. downwards were received. Messrs. T. Vale & Sons, Ltd., of Stourport, Kidderminster, accepted at £4,780.

LEYTON.—For watering and cartage, for the Leyton Urban District Council. Mr. W. Dawson, M.Inst.C.E., Town Hall, Leyton :—

M. H. Abbott & Co., Leytonstone.*

Watering :—Man, horse, and harness, at per day : Division 1, 9s. 6d. ; Division 2, 9s. 6d. ; Division 3, 9s. 6d. ; for the three divisions included in one contract, 9s. 6d.

Cartage :—Cart, horse, and driver, at per day : Division 1, 9s. ; Division 2, 9s. ; Division 3, 9s. ; for the three divisions included in one contract, 9s. Slop cart, horse, and driver, at per day : Division 1, 9s. 3d. ; Division 2, 9s. 3d. ; Division 3, 9s. 3d. ; for the three divisions included in one contract, 9s. 3d. Horse, harness, and man for "slopping," council supplying slop cart, at per day : Division 1, 8s. 9d. ; Division 2, 8s. 9d. ; Division 3, 8s. 9d. ; for the three divisions included in one contract, 8s. 9d. Horse, harness, and man, for "road sweeper," at per day : Division 1, 8s. 9d. ; Division 2, 8s. 9d. ; Division 3, 8s. 9d ; for the three divisions included in one contract, 8s. 9d.

LLANWRDA.—For constructing a new roadway and water supply at Llathygae and Cwm-bach-tel, near Pumpsaint, Llanwrda, for Mr. H. M. Lloyd. Mr. D. Jenkins, architect, Llandilo :—

Water Supply.

Fitzmaurice & Co.	£392	Pritchard Davies, Llandilo*	£350
Evans Bros.	377	William Morgan.	349

Roadway.

William Morgan	£1,048	Evans Bros.	£888
Pritchard Davies	965	Fitzmaurice & Co.	876

LICHFIELD.—For improvement and extension of sewerage system, for the Corporation of Lichfield. Messrs. Elliott & Brown, engineers, Burton-buildings, Parliament-street, Nottingham. Quantities by engineers :—

J. White, jun.	£9,828	T. Lowe & Sons	£7,650
Jas. Jameson	9,000	W. Williams	7,400
O. Warburton	8,300	G. J. Tomlinson	7,374
Bentley & Loch†	8,322	Johnson & Langley, Leicester*	7,306
Fitzmaurice & Co., Ltd.	8,258	W. Walkerdine	7,136
Siddons & Freeman	7,900	J. Holme	7,129
J. Laing	7,721	W. H. Pickin†	7,102
H. H. Barry	7,660	J. W. Dean, Ltd.	6,920

† Withdrawn.

LONDON.—For reconstruction, for electrical traction, of the Streatham cable tramways, and construction of authorised tramways at Tooting, for the London County Council :—

George Law	£128,587 11 3
William Kennedy	113,896 12 11
John Mowlem & Co., Ltd.	111,710 0 0
Pethick Brothers	110,142 16 8
Robert W. Blackwell & Co., Ltd.	104,604 10 6
William Underwood & Brother	99,221 0 0
Edmund Nuttall & Co.	97,132 13 1
Dick, Kerr, & Co., Ltd.	95,751 7 9
J. G. White & Co., Ltd.	95,005 7 4
William Griffiths & Co., Ltd., London†	86,623 19 11

† Recommended for acceptance.

LONDON.—For alterations and additions at the Jews' Free School, Spitalfields, E. Mr. Edward Robert Robson, F.S.A, architect, Palace-chambers, Westminster. Quantities by Messrs. John Leaning & Sons, 28, Johnstreet, Bedford-row.

		Net Credit for old materials.
J. Mowlem & Co., Ltd.	£71,990	£100
J. Garrett & Son	57,990	—
Coulsell Bros.	56,479	250
Holland & Hannen	54,697	100
Foster & Dicksee	54,445	400
Holloway Bros.	53,876	176
F. & H. F. Higgs	53,925	500
F. G. Minter	52,488	—
G. H. & A. Bywaters	52,395	50
H. Lovatt	52,200	300
E. Lawrence & Sons	51,585	50
J. Carmichael	50,575	40

LONDONDERRY.—For hot water heating apparatu, in County Council offices, for the Proposals Committee County Council. Mr. Chas. L. Boddie, County Surveyor, Londonderry :—

Riddels, Ltd.	£328	Maguire & Gatchell, Ltd.	£308
Joseph Donaghy	319	Lancashire Heating Co., Manchester*	287
Musgrave & Co.	318		
Brightside Foundry & Engineering Co.	318		

LONDON SCHOOL BOARD TENDERS.

Buckingham-terrace School, North Kensington, for Halls and other Improvements.

Providing halls, about 45 ft. by 31 ft., for all departments ; new infants' teachers' room and additional cloakroom ; re-stepping classrooms in the boys' and girls' departments. Heating by open fires and stoves. The alterations will result in a net reduction of twenty-four places in the total accommodation of the school, the revised accommodation, on the completion of the improvements, being for boys, 348 ; girls, 348 ; infants, 442—total, 1,138 :—

Stimpson & Co.	£6,264	J. Simpson & Son	£5,542
Stevens Bros.	5,956	Lathey Bros.	5,333
General Builders, Ltd.	5,928	F. G. Minter	5,333
Marchant & Hirst	5,680	Leslie & Co., Ltd.	5,204
H. Wall & Co.	5,585	Treasure & Son	5,117
		E. Triggs*	5,067

Sydenham Hill-road School, for Enlargement and Improvement of Boys' and Girls' School.

Boys' and girls' departments : Providing halls, about 35 ft. by 28 ft. 6 in. ; two new classrooms, fifty and forty-eight each, for boys' department ; providing one new classroom for fifty and enlarging one classroom to sixty in girls' department ; additional staircase for girls' ; two new rooms for teachers, cloakrooms and lavatories ; re-dividing and re-lighting existing classrooms ; providing new heating chamber and low-pressure hot-water apparatus. Providing combined cookery and laundry centre, and manual training centre for twenty boys ; new covered playground for girls' and infants' ; refixing present boys' covered playground ; removing existing babies' w.c.'s and rebuilding same ; and enclosing, draining, and tar-paving the additional land. Revised accommodation—Boys, 326 ; girls 346 ; total, 672. Net gain of places—Boys, 32 ; girls, 62 ; total, 94.

F. & H. F. Higgs	£11,999	W. J. Mitchell & Son	£10,928
G. E. Wallis & Sons	11,344	J. Appleby & Sons	10,850
General Builders, Ltd.	11,341	J. Garrett & Son	10,663
E. Lawrance & Sons	11,080	Martin, Wells & Co., Ltd.	10,648
Patman & Fotheringham, Ltd.	10,985	J. Smith & Sons, Ltd.	10,464
Lathey Bros.	10,933	J. & C. Bowyer*	10,357

Hearnville-road Site, Balham, for Erecting Three Brick Structures for Temporary School Accommodation in the first instance.

Holloway Bros., Ltd.	£5,207	Lathey Bros.	£4,953
W. Akers & Co.	5,187	J. Garrett & Son	4,880
E. P. Bulled & Co.	5,075	W. Johnson & Co., Ltd.	4,850
General Builders, Ltd.	4,995	Martin, Wells, & Co., Ltd.	4,824
Spencer, Santo, & Co., Ltd.	4,984	Stimpson & Co.	4,795
T. D. Leng	4,975	Edwards & Medway	4,792
J. Carmichael	4,962	E. Triggs*	†4,697
Rice & Son	4,958	J. Appleby & Sons	4,230

† This amount is inclusive of the sum of £125 for extra for glazed brick internal facings.

[A letter was received from Messrs. J. Appleby & Sons, whose tender is lowest, stating that they had made a clerical error in their tender, which should read as £4,630 ; and withdrawing their tender.]

Various articles of furniture :—

(*a*) Mr. H. Bouneau, of Nos. 1A and 2, Royal Victor-place, Old Ford-road, E., for the supply of large green baize notice boards, at 2s. 9d. per foot run.*

(*b*) Mr. T. Cruwys, of No. 73, Camden-street, Camden Town, N.W., for the supply of (i.) E.C. boards (large), at £4 16s. per doz. ; (ii.) do. (small), at £3 11s. per doz. ; and (iii.) tool racks for Manual Training Centres, at £1 3s. each.*

(*c*) Messrs. G. M. Hammer & Co., Ltd., of No. 370, Strand, for the supply of (i.) swing slates (No. 1), at £1 18s. each ; and (ii.) do. (No. 2), at £2 7s. 6d. each.*

(*d*) Messrs. T. R. Roberts, Ltd., of Upper-street, Islington, N., for the supply of (i.) slate slabs (No. 1), at 11s. 1d. each ; and (ii.) do. (No. 2), at 6s. 2d. each.*

(*e*) Messrs. T. Wallis & Co., Ltd., of Holborn-circus, E.C., for the supply of folding steps at £7 13s. per dozen pairs.*

Running Contracts for the Supply of Sockets and Rubber Rings for Casters.

(*a*) Rubber rings (for castors).

	per doz. s. d.		per doz. s. d.
T. Bugden	7 6	J. G. Ingram & Son	3 9
Sheath Bros.	5 6	Reddaway & Co., Ltd.*	3 0
P. B. Cow & Co.	3 9		

[Previous price, 6s. 10d. per doz. Existing Contract will expire on February 17, 1904.]

(*b*) Sockets (for Union Jacks).

	per doz. s. d.		per doz. s. d.
F. Bird & Co.	10 6	Pryke & Palmer	6 8-16-25
J. Franklin & Son	7 3	Dawes, Bette, & Co.*	6 6
Portway & Sons	7 0		

[Previous price, 6s. 10d. per doz. Late contract expired on January 20, 1904.]

Running Contract for the Supply of Materials for Repairing Carpenters' Benches.

—		Tops. £ s. d.	Handles. s. d.	2-in. Screws. s. d.	2½-in. Screws. s. d.	Approximate annual expenditure calculated on the tender of each Contractor. £ s. d.
H. Bouneau	each	0 12 0	0 4	1 5	1 6	61 12 4
W. Erake & Co.	,,	1 3 0	1 0	2 6	3 0	120 16 0
General Builders, Ltd.	,,	1 1 0	1 6	2 6	3 0	119 12 0
Goodall, Lamb, & Heighway, Ltd.	,,	1 3 0	—	—	—	—
G. M. Hammer & Co., Ltd.	,,	0 14 6	0 6	1 6	1 9	73 6 6
Marchant & Hirst	,,	0 7 6	0 6	2 0	1 9	55 12 6
E. Spencer & Co.*	,,	0 8 6	0 4	1 6	1 8	52 10 4
Previous prices	,,	0 10 0	0 4	1 5	1 6	—

Repairs on Schedule of Prices.

In accordance with the authority granted by the Board on the 4th February, 1904, the Works Committee have now obtained fresh tenders for carrying out repairs to the schools of the Board in Group 2 of the Tower Hamlets Division on the printed Schedule of Prices as revised.

[The percentages required by the contractors to be added to the printed Schedule of Prices are shown below The percentages under "A" are for repairs, measured work, under "B" for sanitary measured work (executed under the orders of the Sanitary Surveyor) ; and under "C" for day work generally, i.e., wages and materials. The small repairs to the schools in this Group are done by workmen employed direct by the Board.]

		A For Repairs, measured work.	B For Sanitary, measured work.	C For Daywork, generally.
J. Dolman & Co.	percentages on Schedule	+ 15	+ 25	+ 10
J. F. Holiday	,,	+ 12½	+ 20	+ 12½
Parrott & Isom*	,,	+ 15	+ 15	+ 15
A. J. Sheffield	,,	+ 20	+ 33⅓	+ 15
Vigor & Co.	,,	+ 22½	+ 37½	+ 17½
Previous Percentages		+ 20	+ 25	+ 10

TENDERS—*Continued on page 211.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom required.	Premiums.	Designs to be delivered
*Designs for Isolation Hospital	Barnet Hospital Committee	Not stated	May 9
*Proposed Memorial Building	Eton College	Not stated	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Boundary Wall, Plymouth grove Recreation Ground	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	Feb. 19
Gates and Iron Fencing, do.	do.	do.	do.
Morrill-street Extension	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Buildings, 201, High-street, Elgin		J. Wittet, Architect, Elgin	do.
Bakery, Coal Stores, etc.	Newton Abbot Corporative Soc., Ltd.	S. Segar, Architect, 24, Union-street, Newton Abbot	Feb. 20
Electric Light, Boroughmuir School	Edinburgh School Board	J. A. Carfrae, 3, Queen-street, Edinburgh	do.
Cast Iron Pipes	Harrogate Corporation	E. W. Dixon, M.Inst.C.E., 14, Albert-street, Harrogate	do.
Hothouses at Ruchill Hospital	Glasgow Corporation	Superintendent of Parks, City-chambers, Glasgow	do.
Alterations, Golden Lion Inn, Romanby, N'thallerton	Plews & Sons	W. H. Bourne, Architect, Darlington	do.
Add. to Hide & Skin Stores at Abattoir, M'Auley-st.	Belfast Corporation	City Surveyor's Office, Belfast	do.
Brick Kiln-lane Works	Coventry Corporation	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry	Feb. 22
Supplies	Stafford Corporation	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
Making-up Rutland-road-lane, etc.	Plymouth Corporation	J. Paton, Borough Engineer, Plymouth	do.
Materials	Kingston Guardians	J. Edgell, Union Offices, Coombe-road, Kingston-on-Thames	do.
Eight Houses, Barrass-terrace, Upper Wortley		J. Charles & Son, 98, Albion-street, Leeds	do.
Water-Closet Works, Whetley-lane School	Bradford Education Committee	Architect's Department, Education Office, Manor-row, Bradford	do.
Boundary Walls and Railings, Thackley School	do.	do.	do.
Alter., etc., Richm. Bl. Inst., 41, U. S'kville-st., Dublin		Patterson & Kempster, 95, Lower Leeson-street, Dublin	do.
Materials	Macclesfield R.D.C.	Assistant Clerk at Union Offices, Macclesfield	do.
Completion of St. Mary's Church, Wombwell		C. & C. M. Hadfield, Architects, 19, St. James-street, Sheffield	do.
Tail Shafts for Ferry Steamers	Wallasey U.D.C.	Manager, Egremont Ferry, Cheshire	do.
Stores (Electric Lighting)	Battersea Borough Council	Electrical Eng., Electric Light Station Lombard-rd., London, S.W.	do.
Foundations of Cricket Pavilion, Cardiff Arms Park		Veall & Sant, Architects, Cardiff	do.
Building Two Lead Stacks, Elswick Lead Works	Walkers, Parker, & Co.	J. Little, Engineer, Viaduct-chambers, Carlisle	do.
Covered Way at Workhouse Infirmary	Warwick Guardians	F. P. Trepass, 1, Church-street, Warwick	do.
One 750 kw. Continuous Current Dynamo	Aston Manor Corporation	T. J. Ballard, Eng., Electricity Works, Chester-st., Aston Manor	Feb. 23
Quarrying and Carting Road Material	Midlothian County Council	Road Office, 29, St. Andrew-square, Edinburgh	do.
Painting, etc., Baths Roof, Pitfield-street	Shoreditch Borough Council	Borough Surveyor, Town Hall, Old-street, E.C.	do.
Thirteen Houses, Scarbottom, Mytholmroyd		T. Kershaw, A.R.I.B.A., Lancs. & Yorks Bank-chambers, Halifax	do.
Air Compressor, Steam Engine, etc.	Health Committee, Stafford	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
Granite	Foleshill R.D.C.	A. P. Oswin, Clerk, Council Offices, Little Heath, Foleshill	do.
Rebuilding Railway Hotel, Askern	Carter's Knottingley Brewery Co.	Garside & Pennington, Architects, Pontefract	do.
Disinfectant	Middleton Corporation	C. H. Norton, Sanitary Inspector, Town Hall, Middleton	do.
*Annual Contracts	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Roadmaking and Paving Works	do.	do.	do.
Comiston-road Sewer	Edinburgh City Council	Burgh Engineer, City-chambers, Edinburgh	Feb. 24
Erection, Removal, and Repair of Stalls for Markets	Kingston-on-Thames Corporation	H. A. Winser, Town Clerk, Municipal Offices, Kingston-on-Thames	do.
Electricity Meters, etc.	Hammersmith Borough Council	G. G. Bell, Borough Electrical Eng., 57, Fulham Palace-rd., London	do.
Additions, etc., to Steading at Midtown, Glass		J. S. Thomson, Blairmore Estates Office, Fife, Keith	do.
Shop and Dwelling-house at Bowerham, Lancs.	E. Williams	J. Parkinson, Architect, 67, Church-street, Lancaster	do.
Villa at Coedsaeson, near Swansea		C. T. Ruthen, Architect, Bank-chambers, Heathfield-st., Swansea	do.
Sunday School, Lower Darwen	United Methodist Free Church	Sames & Green, Architects, Knott-street, Darwen, Lancs.	do.
One 750 kw. Steam Alternator	Ealing Corporation	J. D. Knight, Engineer, Electricity Works, South Ealing, W.	Feb. 25
Paving Streets	Gateshead Corporation	J. Bower, C.E., Borough Engineer, Town Hall, Gateshead	do.
Materials	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Electric Generator	Greenock Corporation	J. A. Robertson, Burgh Electrical Eng., Hunter-place, Greenock	do.
Five Motors		W. H. Archer & Son, The Grove, Gravesend	do.
Granite, etc.	Tadcaster R.D.C.	T. Scott, Surveyor, Aberford, near Leeds	do.
Carting Materials	do.	do.	do.
Steel Works, St. Peter's-square	Harrogate Corporation	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	do.
Furnishings, etc., & Works, for Lighting Department	Glasgow Corporation	Lighting Department, 52, College-street, Glasgow	do.
Sewer., Pav., etc., Sts. & Passa., Seaford-rd. Pendleton	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Building a Wall, do.	do.	do.	do.
74 Cottages, 6 Houses, and 25 Shops, do.	do.	do.	do.
56 Cottages and 8 Houses, do.	do.	do.	do.
36 Cottages and 7 Houses, and 1 Shop, do.	do.	do.	do.
34 Cottages and 7 Houses, do.	do.	do.	do.
Painting Cemetery Chapels, etc.	Burial Board Committee, Stafford	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
Stone, etc.	Brixworth R.D.C.	W. C. Woodford, Market-square, Northampton	do.
Hauling Materials	do.	Mr. Wykes, 5, Elysium-terrace, Northampton	do.
Pair of Cottages, East Harting, near Petersfield	E. Lephard	J. Luff, East Harting Farm, Petersfield	do.
Police Station, Kelso		Police Station, Kelso	do.
Vestry, etc., St. Mary's Church, Roch, Pembroke		D. E. Thomas, Architect, Victoria-place, Haverfordwest	do.
*Cottages, Houses, and Shops, Pendleton	Salford Borough Council	Borough Engineer, Town Hall, Salford	do.
*Works and Materials	Hackney Borough Council	Borough Surveyor, Town Hall, Hackney, N.E.	do.
Electricity Works Contracts	Stourbridge U.D.C.	J. B. Clarke, Engineer, Town Hall, Stourbridge	Feb. 26
Workmen's Library, Institute, etc., Caeran, Maesteg	Trustees	E. W. Burnett & Son, Architects, Jarrow House, London	do.
Five One-horse Carts	Newburn U.D.C.	T. Gregory, Surveyor, Newburn-on-Tyne	do.
Materials, etc.	do.	do.	do.
Extensions to Engineering Works, Hare-st., Halifax.	Stead Bros.	T. Kershaw, A.R.I.B.A., Lancs. & Yorks Bank-chambers, Halifax	do.
Presbyterian Church, Hawthorn-road, Llandaff		D. Pugh-Jones, Architect, Queen's-chambers, Queen-street, Cardiff	do.
Two Shops and House in Cross-street, Camborne	Mrs. Faull	C. Richards, Pendarves-street, Tuckingmill, Cornwall	do.
*Refreshment Room and Kitchen, Victoria Park	London County Council	Architect's Department, 15, Pall Mall East, S.W.	do.
†500 Tons of c.i. Pipes	Glasgow Corporation	J. R. Sutherland, Eng. to Water Dept., 45, John-street, Glasgow	Feb. 27
Steam Dynamo	St. Anne's-on-the-Sea U.D.C.	J. H. Clothier, Engineer, Electricity Works, St. Anne's-on-the-Sea	do.
Caretaker's House and Reading Room	The Horden Collieries, Ltd.	G. Wells, Shotton Colliery	do.
1,000 Tons English Portland Cement	Harrogate Corporation	E. W. Dixon, M.Inst.C.E., 14, Albert-street, Harrogate	do.
Limestone and Team Labour	Llandaff and Dinas Powis R.D.C.	J. Holden, Surveyor, Llandaff-chambers, Cardiff	do.
Clee Hill Stone	do.	do.	do.
Tools, Cartings, etc.	do.	do.	do.
6,000 Tons of Whinstone and Gravel	East Riding County Council	County Surveyor, Beverley	do.
Team Labour	do.	do.	do.
Two Miles of Fencing, Glendinning, etc.	Kirkcaldy Corporation	J. Stark, Westerhall, Langholm, N.B.	do.
Electric Tramways for Specification No. 24	Wilts and Dorset Bank	O. F. Francis, Burgh Electrical Engineer, Victoria-road, Kirkcaldy	do.
Additions, etc., to Bank, Newport-road, Cardiff	Manchester Education Committee	E. H. Bruton, F.R.I.B.A., 119, Queen-street, Cardiff	do.
Add., etc., Bank Meadow Municipal School, Ardwick		Education Office, Deansgate, Manchester	do.
House, Ardgye	Workington Bridge & Boiler Co., Ld.	J. Wittet, Architect, Elgin	do.
Temporary Staging for Bridge, Carlisle	Thrapston R.D.C.	J. Eden, C.E., 58, Pow-street, Workington	do.
Granite, etc.	Glam. Quarter Sess. & Coun. Council	C. Hannyton, Clerk to Council, Thrapston	do.
Police Station at Lenghenydd, near Caerphilly	Building Club	T. Mansel Franklin, County Council Offices, Westgate-st., Cardiff	do.
Sixteen Cottages at Graigberthlwyd, near Treharris	Heaton Norris U.D.C.	W. Dowdeswell, Architect, Treharris	do.
Materials and Stones		F. W. Brooke, Council Offices, Heaton Moor	do.
Reading and Recreation Rooms, Nethy Bridge	Portmadoc & N. Wales Co.	The Reading Rooms, Granite Villa, Nethy Bridge, Inverness	do.
1¼ Miles of Steel Piping, Snowden Power Station	King's Norton and Northfield U.D.C.	Harper Bros., Engineers, 13, St. Helen's-place, London, E.C.	Feb. 29
Stores	Bangor U.D.C.	Surveyor, 23, Valentine-road, King's Heath	do.
Pipe Sewer in Seacliffe-road	Stevning West R.D.C.	E. L. Woods, C.E., Town Hall, Bangor, co. Down	do.
Chalk, Flints, and Granite	Edinburgh Gas Commissioners	E. Cripps, Clerk, Council Offices, New Shoreham, Sussex	do.
Main Pipes	Halifax Corporation	W. R. Herring, Engineer, New-street Works, Edinburgh	do.
Stores and Materials, Highways and Tramways		J. Lord, Borough Engineer, Town Hall, Halifax	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Stores, Electricity Department	Halifax Corporation	W. M. Rogerson, Borough Electrical Engineer, Foundry-st., Halifax	Feb. 29
Stores, Tramways Department	do.	F. Spencer, Tramways Manager, Southern Depot, Halifax	do.
Midhurst Drainage, Contract No. 1	Midhurst R.D.C.	J. Taylor, Sons, & S. Crump, Engs., 27, Gt. George-st., Westminster	do.
Stores (Electric Lighting)	Electricity and Tramways Com.	A. S. Giles, Engineer, Electricity Works, Jubilee-street, Blackburn	do.
Pipework, etc., Electric Light, etc., Supply	Kilmarnock Corporation	W. Middlemas, Town Clerk, Kilmarnock	do.
Lamps, Electric Light, etc., Supply	do.	do.	do.
Lighting & Tract'n Feeders, etc., Elec. Light, etc., Sup.	do.	do.	do.
Meters, Electric Light, etc., Supply	do.	do.	do.
Stores for Electricity Works	Hornsey Town Council	N. Staniland, Borough Electrical Eng., Tottenham-lane, Hornsey	do.
*Cables and Cable Stores	do.	do.	do.
*Stores, Road Materials, etc.	York Corporation	City Engineer's Office, York	do.
1,983 Yds. of Stone Flagging for Pavem't, Duncrue st.	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast	do.
Fifty Cottages, Nicholas-street, Limerick	Thomond Artisan Dwellings Co.	J. F. Power, Carr-street, Limerick	do.
Eighty Tons c.i. Pipes, etc.	Sandal U.D.C.	F. Massie, A.M.Inst.C.E., Tetley House, Wakefield	do.
Material	Bolton-upon-Dearne U.D.C.	J. L. Hawksworth, Clk., Co. Of., Bolton-upon-Dearne, Rotherham	do.
Road Works, Park-crescent, Roundhay	Leeds District Council	E. J. Silcock, M.Inst.C.E., 10, Park-row, Leeds	do.
Sewering, Paving, etc., Streets and Passages	Waterloo-with-Seaforth U.D.C.	F. S. Yates, Surveyor, Town Hall, Waterloo, near Liverpool	do.
School Furniture, Shaftesbury-road School	East Ham Education Committee	H. C. Padgett, Education Office, East Ham, E.	do.
Renewal of Guild-street Bridge, Aberdeen	Caledonian Railway Company	P. M. Barnett, C.E., 80, Guild-street, Aberdeen	do.
Enlargement to Auchtermuchty School	.....	W. Birrell, Architect, 200, High-street, Kirkcaldy	do.
Fire Station, Borough-road, Darlington	Corporation	G. Winter, Borough Surveyor, Town Hall, Darlington	do.
Sunday School, Wesleyan Ch., Shortlane End, Truro	.....	H. Northey, Saddler, Shortlane End	do.
*Annual Contracts	Hendon U.D.C.	Council's Surveyor, Council Offices, Hendon, N.W.	do.
House and Shop Refuse Contract	Waterloo with Seaforth U.D.C.	F. S. Yates, Surveyor, Town Hall, Waterloo, near Liverpool	Mar. 1
Sewerage Works and Bridge, Langley Park	Lanchester R.D.C.	J. R. Lupton, Surveyor, Lanchester	do.
Painting, Papering, etc., Dispensary, etc., Crumlin	Antrim Union	Mr. Carkin, Crumlin, Antrim	do.
Business Premises and House, New Tredegar	Isaac Pruss	G. Kenshole, Architect, Station-road, Bargoed	do.
Twenty Houses, Bedlinog	Bedlinog Building Club	P. Vivian Jones, Architect, Bengoed	do.
Schools, Cawood, near Selby	Cawood Feoffees	T. S. Ullathorne, Architect, Selby	do.
Street Improvement and Surface Water Drainage	Kirkby-in-Ashfield U.D.C.	W. Dodsley, Surveyor, Stockwell-gate, Mansfield	do.
Sewering Mill Fold-road	Middleton Corporation	W. Welburn, Town Hall, Middleton	do.
Celtic Cross, Gill Abey, Cork	Com., Cork Soldiers' Memorial	W. H. Hill & Son, Architects, 28, South-mall, Cork	do.
Pier or Breakwater & Quay, Pennan Harbour, Aberdeen	.....	J. Barron, M.Inst.C.E., 216, Union-street, Aberdeen	do.
*Making-up Roads	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*New Stabling at Reliance Wharf, Hertford-road, N.	M.B. of Shoreditch	Borough Surveyor, Town Hall, Old-street, E.C.	do.
Scavenging and other Works	Llandaff and Dinas Powis R.D.C.	M. Warren, Clerk, Llandaff chambers, Cardiff	Mar. 2
Restoration of Roofs of Wolborough Church	Rector and Churchwardens	W. Rowell, Architect, 2, St. Paul's-road, Newton Abbot	do.
Materials (Stones, etc.)	Headington R.D.C.	J. C. Coates, Dis. Surv., Hartfield Cott., New Headington, Oxford	do.
Carting Work	do.	do.	do.
Team Labour	Northampton R.D.C.	R. W. Wood, District Surveyor, Kislingbury	do.
Stone, etc.	do.	W. Tomalin, 14, Guildhall-road, Northampton	do.
Painting Station Buildings	N.E. Ry.	C. A. Harrison, Engineer, Central Station, Newcastle	do.
Block of Offices at Forth Banks, Newcastle-on-Tyne	do.	W. Bell, Architect, Central Station, Newcastle	do.
Ten Ornamental Shelters	Blackpool Corporation	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool	do.
90 ft. of Old Iron or Steel Circular Boiler Shells	St. Austell R.D.C.	T. H. Andrew, Engineer, 1, Trevarrick Villas, St. Austell	do.
*New Corridor to Entrance Lodge, Norwood Schools	Lambeth Guardians	Clerk, Brook-street, Kennington-road, S.E.	do.
*Annual Contracts	Southgate U.D.C.	Council's Surveyor, Palmer's Green, N.	do.
*Annual Contracts	Borough of Hampstead	Borough Engineer, Town Hall, Haverstock Hill, N.W.	do.
Steel Suspension Foot-bridge at Blackhall Mill	Blaydon U.D.C.	G. Lyon, Surveyor, Blaydon-on-Tyne	Mar. 3
Timber Wharf at Runcorn	Manchester Ship Canal Co.	W. H. Hunter, M.Inst.C.E., 41, Spring-gardens, Manchester	do.
*Triennial Contracts for Repairs	Receiver for Metrop. Police District	Police Surveyor, New Scotland Yard, S.W.	do.
Wesleyan Chapel, Crowle, Lincs.	.....	T. B. Thompson, Architect, 15, Parliament-street, Hull	Mar. 4
Gas Holder and Steel Tank, Penrhiwceiber	Mountain Ash U.D.C.	Corbett, Woodall, & Son, Eng., Palace-ch., Bridge-st., Westminster	do.
Materials and Stores	Levenshulme U.D.C.	J. Jepson, Surveyor, 8A, Tiviot-dale, Stockport	do.
*Superstructure, Northern District Post Office	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	do.
Three Miles of Tramways, Coventry	New General Traction Co.	J. E. Winslow, Engineer, 20, Bishopsgate-street Within, E.C.	Mar. 5
Reconstruction of 5¼ Miles of Tramways, Coventry	do.	do.	do.
Road Material and Carting	Rotherham R.D.C.	R. Bradbury, District Surveyor, 29B, High-street, Rotherham	do.
Flints	Steyning West R.D.C.	E. Cripps, Clerk, Council Offices, New Shoreham, Sussex	Mar. 7
Road Materials	Wangford R.D.C.	F. S. Rix, Clerk to Council, Beccles	do.
Road and Street Works	Holywood U.D.C.	J. H. Barrett, Council Office, Town Hall, Holywood	do.
*Works and Materials	St. Marylebone Borough Council	Town Clerk, Town Hall, St. Marylebone, W.	do
Materials	Batley Town Council	O. J. Kirby, Borough Surveyor, Branch-road, Batley	Mar. 8
*Supply of Waterproof Clothing	West Ham Borough Council	Borough Engineer, Town Hall, Stratford, E.	do.
*New Tower and Completion of Church, Hertford	.....	Austen & Paley, Architects, Lancaster	do.
*Circular Service Reservoir, etc.	Longleat Estate Office, Warminster	Wilcox & Rakes, 63, Temple-row, Birmingham	do.
Whinstone, Dumbartonshire Roads	.....	H. Hutcheson, Clerk, 115, Wellington-street, Glasgow	Mar. 9
Quarrying, etc., Gravel	Wimborne and Cranborne R.D.C.	R. T. S. Seymour, Surveyor, Wimborne Minster	do.
*Painting, etc., 62-68, Fuller-street, Bethnal Green	.....	W. Brick, North-street, Horsham	do.
Materials	Bingham R.D.C.	R. H. Beaumont, Clerk, Market-place, Bingham	do.
Concrete to Footways	South Shields Corporation	S. E. Burgess, Borough Engineer, Chapter-row, South Shields	do.
Infectious Diseases Hospital, Alvaston	Nantwich Joint Hospital Board	C. E. Davenport, Architect, Nantwich	Mar. 10
*Works to Church, Walton-le-dale	The Committee	The Vicarage, Walton-le-Dale	Mar. 11
Church, Spiddal, co. Galway	Rev. M. D. Conroy, P.P.	W. A. Scott, A.R.I.B.A., 72, Hollybank-road, Drumcondra, Dublin	Mar. 12
*Engine Shed and General Depot	Romford R.D.C.	Council's Surveyor, Victoria-chambers, Romford	Mar. 14
Roof Boarding & Painting, Purifier House, Great Float	Wallasey U.D.C.	J. H. Crowther, Engineer, Gasworks, Great Float, near Birkenhead	Mar. 17
*Heating Apparatus to Library	Branksome Public Library	S. J. Newman, Branksome	Mar. 18
Covered Service Reservoir	Chelmsford Corporation	C. Brown, A.M.Inst.C.E., 16, London-road, Chelmsford	Mar. 28
2,253 Yards c.i. Pipes	do.	do.	do.
Pipe Laying	do.	do.	do.
Repairs and Painting to County Buildings, etc.	Northumberland County Council	J. A. Bean, County Surveyor, The Moot Hall, Newcastle-on-Tyne	No date.
Annual Contracts	Wimbledon U.D.C.	Council Offices, Wimbledon	do.
Provision Stores	Birkenshaw Industrial Soc., Ltd.	A. T. Verity, Architect, Birkenshaw	do.
Four Cottages, Weybridge (labour only)	.....	T. Atkinson, 10, Clifton-road, Kingston Hill	do.
Jetty and Sheds, on River Tivy, Cardigan Bridge	.....	Secretary, Western Counties Co-operative Assoc., Ltd., Plymouth	do.
*Supplies	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington, W.	do.
*New Boy's School, Spennymoor	Tudhoe (U.D.) School Board	F. H. Livesay, Architect, Bishop Auckland	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Sanitary Inspector	Woolwich Borough Council	120*l.*	Feb. 27
*Surveyor's Assistant	Romford R.D.C.	2*l.* 2*s.* per week	Feb. 29
*Architect's Assistant	Sheffield Corporation	Not stated	No date.
*Engineer	do.	Not stated	do.
*Assistant Surveyors	Admiralty	150*l.*	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

TENDERS.—*Continued from page* 209.

LONDON.—For foreman engineer's house at the central station, Long-grove Asylum, for the London County Council :—

Charles Wall £831

LONDON.—For the erection of Guardians' offices, etc., at Camberwell, for the Guardians of St. Giles', Camberwell. Mr. Edwin T. Hall, architect, 54, Bed ord-square, W.C. :—

Patman & Fotheringham	£22,200	Holliday & Greenwood	£20,677
Holloway Bros.	21,648	Gough & Co.	20,554
G. Parker	21,647	Higgs & Hill	20,474
Foster & Dicksee	21,234	H. L. Holloway	20,137
Balsam Bros.	21,150	F. & H. F. Higgs	20,060

LONDON.—For electric light extension at the Marshall-street Baths and Washhouses, for the Westminster City Council :—

Tamplin & Co.	£405 0 0	Taylor & Co.	£263 0 0
Rider & Co.	359 7 0	Bakewell & Co.	258 11 0
The District Electric Co.	269 0 0	Bromley & Co.	236 3 0
Jackson Bros.	265 0 0	Potter & Sons*	178 0 0

LONDON.—For sinking a preliminary boring in connexion with the deepening of the present well on the Long-grove Asylum estate, with a view to obtaining an increased supply of water, for the London County Council :—

Thomas Docwra & Son £933

LONDON.—For the erection of the watchman's shelter and tool and potting shed at the central garden, Millbank estate, Westminster :—

Spencer, Santo, & Co. £295 13 0

LONDON.—For works at the epileptic colony, for the London County Council :—

Fitting up Laundry : W. Summerscales & Son £1,369 14 6

Heating Apparatus in Store and Single Room in Two of the Villas : Geo. Wright & Sons 104 10 0

Fitting up of Padded Room : Pocock Bros. 87 10 0

TENDERS.—*Continued on page* 212

LONDON.—For the erection of (1) stables, and (2) disinfecting station at Digby-street, for the Bethnal Green Borough Council:—

	Stables.	Disinfecting Station.
T. Almond & Sons	£7,300 0	£2,998 0
E. Brown & Son	7,497 10	3,095 0
W. G. Brown	—	2,926 0
J. Dolman & Co.	6,983 0	2,726 0
R. & E. Evans	7,356 0	2,915 0
J. Ferguson & Co.	7,090 0	2,837 0
Foster Bros.	6,988 0	2,837 0
F. Gough & Co.	7,094 0	2,890 0
J. Haydon & Sons	7,879 8	3,070 18
F. & H. F. Higgs	7,350 0	2,975 0
H. L. Holloway	7,184 0	2,842 0
Henry Kent	7,225 0	2,879 0
S. Kind	—	3,500 0
Knight & Son	6,927 0	2,762 0
W. Lawrence & Son	6,984 0	2,894 0
R. A. Lowe	7,623 0	2,999 0
William Mills	8,018 0	3,097 0
Albert Monk	7,398 0	2,998 0
S. E. Moss	6,950 0	3,000 0
B. E. Nightingale	6,989 0	2,784 0
Charles North	7,283 0	2,979 0
Sheffield Bros.	7,277 0	2,998 0
J. Shillitoe & Son	7,150 0	2,850 0
Terry Building Co.	7,300 0	3,000 0
W. Thomerson & Son	8,550 0	3,400 0
Todd & Newman	Irregular.	Irregular.
G. Wales & Co., Ltd.	8,340 0	3,612 0
L. Whitehead & Co., Ltd.	7,310 0	2,943 0
Wilkinson Bros.	7,448 0	3,052 0
F. Willmott	7,449 0	2,995 0
F. & F. J. Wood	7,640 0	3,043 0
C. Yates & Co.	7,323 0	2,978 0
J. Appleby & Sons, Cornwall Works, Lambeth, S.E.*	6,730 0	2,720 0

MAXSTOKE (Warwickshire).—For the erection of an entrance lodge and a coachman's cottage at Maxstoke Castle, near Coleshill, Warwickshire, for Mr. Beaumont T. Fetherston. Mr. Charles M. C. Armstrong, architect, 5, High-street, Warwick:—

E. A. Isherwood	£1,445	Kelley & Son	£1,340
G. F. Smith & Sons	1,434	C. Hope, jun.	1,300
Isaac Langley	1,424	F. Davis, Moseley†	1,275

MELKSHAM.—For sewering and sewage disposal works, including settling tank, filter, engine house, etc., for the Urban District Council. Mr. Sydney Howard, Engineer, Bradford-on-Avon:—

Johnson Bros.	£14,191 6 6	Bugbird & Seagrim	£10,093 5 9
F. W. Trimm	13,272 0 0	G. Rutter	10,082 16 0
T. Free & Co.	12,316 0 0	H. Brown	9,966 0 0
Wills & Son	12,190 0 0	S. Wood	9,450 0 0
H. & C. Spackman	11,400 0 0	Johnson & Langley	9,321 6 0
E. Ireland	11,224 1 1	J. Jackson	8,800 0 0
J. W. Dean, Ltd.	11,148 1 9	A. S. Morgan & Co., Newport, Monmouth*‡	8,790 0 0
H. Roberts	11,000 0 0		
S. Ambrose	10,682 8 10		
J. Riley	10,453 0 0		

‡ £20 was included for extra printing, which is not included in the other tenders.

MERTHYR.—For erecting two shops in High-street, for Mr. A. J. Howfield. Mr. C. M. Davies, architect. Quantities by architect:—

Evan Jones	£1,581 0	S. Hawkins	£1,107 0
E. L. Sullivan	1,236 16	M. Warlow, Merthyr*	1,080 0
John Williams	1,217 6		

MIDSOMER NORTON (Somerset).—For alterations and additions to Town Hall premises, for the Urban District Council. Mr. W. F. Bird, C.E., Surveyor. Quantities by Surveyor:—

Wills & Sons	£966 0	W. A. Catley, Midsomer Norton*	£841
W. J. Heal	840 10		

[Engineer's estimate, £831.]

MORLEY.—For erecting a rag warehouse and stables in Townend, for Messrs. H. B. and J. E. Banks. Messrs. T. A. Buttery and S. B. Birds, architects, 1, Basinghall-square, Leeds:—

Builder: N. & H. Sykes, Westfield-road Morley*	£569 0 0
Joiner: Albert Furness, Morley*	498 0 0
Plumber: William Anty, Morley*	83 0 0
Plasterer: Edward Wilson, Morley*	34 0 0
Slater: John Atkinson & Son, Morley, Leeds*	54 12 0
Ironfounder: Newsum, Askham, & Co., Batley, Carr*	130 0 0

PORT GLASGOW.—For causewaying, etc., Anderson-street and eastern part of Castle-road, for the Town Council. Mr. James Murray, Burgh Surveyor. Quantity Surveyor:—

A. A. R. Lang, Greenock*	£402 7 6	Anderson st.	
"	455 17 1	Castle-road.	

RADCLIFFE (Lancs.).—For paving, flagging, etc., part of Wilton-street, for the Urban District Council:—
Fletcher, Bailey, & Co., Summit Inn, Heywood.*
By schedule.

SOUTHEND-ON-SEA.—For painting exterior of the pier pavilion, for the Corporation. Mr. E. J. Elford, Borough Engineer, Southend:—

Ryan & Belding	£295 0 0	Sawley & Beckwith	£166 0 0
Edmund Searey	275 0 0	J. W. Westwood Southend*	165 10 0
M. White	220 0 0	R. Athey	149 0 0
J. Carter & Co.	200 0 0		
Vigor & Co.	195 0 0		
T. H. Fuller & Co.	167 11 8		

[Surveyor's estimate, £135.]

STRATHSPEY.—For water supply works, Knockando-Glenlivet Distillery, Dalbeattie. Mr. C. C. Doig C.E., Elgin:—
J. R. Petrie, Aberlour £305 17

TEDDINGTON.—For making-up, etc., of portion of Kingston-lane, for the Urban District Council. Mr. M. Hainsworth, Surveyor, Teddington:—
S. L. Brice & Sons, Rochester* .. £342 4 2
Sixteen other tenders received.

WINKFIELD (Windsor). — For alterations and additions to Forest Farm, for the Duke of Newcastle. Plans prepared in the Newcastle estate office:—

Hollis & Sons	£6,549	G. Brown	£5,200
B. E. Nightingale	6,140	W. Watson, Ascot*	5190
Holloway Bros., Ltd.	5,950		

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